

# COMPUTERWORLD

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Jerry L. Koory  
FJCC Chairman



Eugene M. Grabbe  
Program Chairman

## FJCC Puts Emphasis on Quality In Planning Conference Program

CW West Coast Bureau

LAS VEGAS, Nov. 14 — "The main emphasis for this conference has been to make the program as strong as we possibly could," said Jerry Koory, chairman of the Fall Joint Computer Conference. "This means not only quality of papers but quality of presentation."

With a record-breaking exhibit area scheduled, Koory stressed that the business of the joint computer conferences is still the technical program.

"We thought when we began

CW's coverage of the FJCC exhibits, begun in last week's issue, is continued this week beginning on Page 29.

planning this conference that hardware papers had run their course. But it didn't turn out that way," said Dr. Eugene Grabbe, program chairman. "Instead we did unusually well in this area."

"We received a lot of software papers, but when they were judged rigorously, most of them fell by the wayside," Grabbe continued. "We used a tough criteria. Not enough of them were really new. Software is sort of on a plateau right now."

There were 325 papers submitted. Of these 82 were accepted. When the committee ran out of good papers, it did not pad the program with mediocre ones, a

spokesman said. As a result, some sessions have only two papers while others have six.

An award is being given, for the first time, for the best presentation of a paper. All sessions are going to be videotaped and judging will be done by reviewing these after the conference.

The size of the conference has made special arrangements necessary. The FJCC '69 Committee has been swamped with more than 200 requests for special facilities so that societies and companies can hold meetings during the week of the conference. This is far more than has been required by previous joint computer conferences.

The Las Vegas Housing Bureau predicts that with more than 11,000 rooms reserved through its offices, the attendance at the conference will exceed 23,000. This does not include those who

(Continued on Page 4)

## Suspend Use, Witness Asks

## Votomatic Attacked at Hearing

By Edward J. Bride

CW Staff Writer

LOS ANGELES — Use of IBM's Votomatic system should be suspended, according to testimony given during the hearings being conducted by the Los Angeles County Elections Security Committee [CW, July 23].

Phyllis Huggins, an editor who has investigated the system, testified that IBM knows its vote-counting system is not tamper-proof and that the current protective test "does not do the full job."

Mrs. Huggins, now a member of CW's news staff, appeared before the blue-ribbon committee this month. During testimony, she called for nationwide "immediate suspension" of the use of Votomatic, currently used in 15 states. She also called on IBM to cease marketing the "computerized product" through a licensee, since the system may be "harmful to the public interest."

In a related statement, William Clauer, president of Intellectron International, called for a halt in the use of Votomatic until the populace could "be certain that the vote can be protected."

### Industry Safeguards

The Los Angeles Times, in a Nov. 11 editorial, called on the computer industry to come up with safeguards around the "human or programming function" of the automatic vote count.

But Mrs. Huggins asked why private individuals and businesses should spend their money "for the intensive study this would require — to provide IBM Corp. with a profit-making product."

She said that programmers have told her it would be "next to impossible" to set up a program that couldn't be tampered

with and, in the unlikely instance that one were developed, there would always remain the doubt that some clever programmer had found still another way.

The Times editorial related how last summer a group of six young computer experts "shocked" county supervisors when they analyzed the system, and announced that election results could be altered "so effectively and cleverly that existing safeguards couldn't detect the rigging."

Mrs. Huggins charged that a high IBM official recently admitted an election could be rigged by "one crooked programmer" and that IBM had dropped out of the vote-counting business [CW, March 19] because it could not risk any bad publicity resulting from such "rigging." At the time, IBM said it considered Votomatic too specialized to warrant full marketing emphasis.

### No Corrective Measures

Mrs. Huggins also charged IBM with failing to protect the public

interest by not advising its customers of the system's vulnerability to tampering and by not seeking corrective measures.

She said that Votomatic poses a serious threat to the security of the vote because it is being used "with blind faith." Rather than a county- or state-level investigation, such as the current hearings in Los Angeles County, she called for the establishment of a national agency to place socially oriented systems "under the same intensive type of study that we give to a drug."

She added that the complexity of computerized systems renders knowledge and management "privity to a few," and that this is not a "safe atmosphere" for the vote or other critical social uses of computers.

### Only One Test

The "logic and accuracy" test, currently the only protective device being used, reportedly failed to detect a programming error in a recent Pasadena election. The

(Continued on Page 4)

## SBC Will Demonstrate 'Mini-Mis' Running Under Its Call/360 Basic

NEW YORK — Mini-Mis, the Service Bureau Corp.'s latest package under Call/360 Basic, will be demonstrated at the company's FJCC booth.

Several levels of inquiry are possible, from short-form questions to lengthy reports. The package is based on two programs — MMINQ and MMFILE.

MMINQ is the record selection and report-generating segment, while MMFILE provides for file creation and maintenance.

### Technical Specifications

Package capabilities include: 1 to 100 fields per record, alpha-

betic or numeric keys, any type of logical record selection and comparison specification, selected printing in any desired order, simple formatted print for quick questions, tailored report layouts, any totals desired, output sorting, output calculations, file maintenance, and file creation.

Through the use of standard Call/360 terminals, the company says, anyone can access any of his data bases for instant reporting and selection without prior training or expertise.

The system can be seen in operation at booths 19018-19021.

## Cobol Compiler for 360/20 Said to Require Only 8K

By Peter L. Briggs

CW Software Editor

PARAMUS, N.J. — A Cobol compiler for the 360/20 that requires only 8K of memory and has capabilities similar to those of Honeywell's Cobol B has been announced by Decision Systems, Inc.

Claimed to be completely upward compatible with other S/360 Cobol compilers, the DSI Cobol operates under the Tape Programming System.

### Long Awaited

Cobol capability for the 360/20 has been much in demand from IBM, which has not yet announced when a Cobol for the Model 20 might become available.

Many users have been dissatisfied with RPG, the current major language for the 360/20, especially when they think in terms of upgrading to a larger system. They have felt that a Cobol compiler could significantly improve the usefulness of the 360/20 as a subsystem in larger installations.

One user mentioned that he would now have much less difficulty obtaining programmers. He said he has had problems finding programmers who wanted to program in RPG.

### Hardware Requirements

The compiler requires two tape drives, a card reader, a printer,

and either a card punch or a third tape drive for output.

All of the standard features of a basic Cobol compiler appear to be present. Such capabilities as the class tests, I/O options, usage of the OCCURS clause, and logical IF statements are included.

### Compiler Output

On the sample program sent to CW, the output looked excellent. The core map was adequate, and the listing was in the standard card-image Cobol format.

No samples of diagnostics were presented, but the company claims that the compiler has excellent diagnostics for most types of Cobol syntax and usage errors.

DSI has offices here at E. 66 Midland Ave.

## On the Inside

Separate Pricing Seen  
Cutting User Costs

— Page 5

FCC Suspends Telpak,  
TWX Rate Increases

— Page 16

Communications .....16  
Editorials .....8  
Education .....17  
Financial .....87  
New Products .....10  
Software .....21  
Societies .....19

## Privacy and Confidentiality Study First

# Gallagher Hails Prerequisites on National Data Bank

WASHINGTON, D.C. — Rep. Cornelius E. Gallagher (D-N.J.) has hailed a report which insists that studies for ensuring privacy and confidentiality be completed before establishment of a National Data Bank.

Although tentatively approving the system, the report cautions that first, a "high level continuing body, including non-governmental members," must come forward with "positive, workable procedures."

The report, entitled "The Behavioral and Social Sciences: Outlook and Needs," was released under the auspices of the National Academy and the Social Science Research Council.

Gallagher, chairman of the Right of Privacy Inquiry, said that he was happy, "for once," to concur in the recommendations of an "academically oriented group over the issue of the National Data Bank."

In a statement prepared for delivery on the floor of the House, Gallagher also applauded the recent formation of a privacy and security committee by the Business Equipment Manufacturers Association (Bema).

Clarence S. Margach, Bema board chairman, commenting on public concern over invasion of privacy [CW, Nov. 5, 1969], suggested one approach could be the establishment of a "rigid

code of ethics . . . and the development of the technical means to safeguard stored data."

Margach said that public faith could be restored by "positive action" in the area of privacy and security, and that Bema had hired a staff member who would devote a "major part of his activities" to this area.

Gallagher said that the formation of the committee by Bema, which includes every major computer maker, represents the first formal recognition of the computer's impact on society "by those who make the machines and, therefore, have the most to lose if they are not used to promote the general welfare."

The congressman mentioned his pleasure in Bema's consideration of the "very real social cost" in the industry. He said he had long regarded his role in leading privacy studies as "creating a constituency for privacy which could counterbalance the rush toward unevaluated use" of computers.

## Wholesalers' Survey Shows Music Men Will Expand EDP Use and Applications

CHICAGO — A survey of music wholesalers indicates that one third of those responding are

using data processing and intend to expand their existing applications.

More than half of those not currently using EDP are seriously weighing its benefits, the survey revealed.

The National Association of Musical Merchandise Wholesalers reported that in the last 20 years, the number of products its average member handles has increased from 2,000 to more than 15,000. All respondents to the survey reported that speed and accuracy in shipping and invoicing are key advantages to the customer, while inventory control and sales analysis provide benefits to the distributor.

Considering the increased number of products, coupled with better service, all respondents using EDP agreed that it helps them manage their businesses more efficiently.

Most of the distributors using EDP take advantage of all information and machinery available to automate their payroll operations, thus simplifying the computation of sales commissions, taxes, Social Security payments, and annual withholding reports. This enables stabilization of costs in another area of the business.

The method of obtaining EDP varies from member to member. Some own their own equipment and operate it on-site. Others lease the equipment, and still others utilize service bureaus to obtain the results they desire.

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### SOFTWARE ENTREPRENEURS


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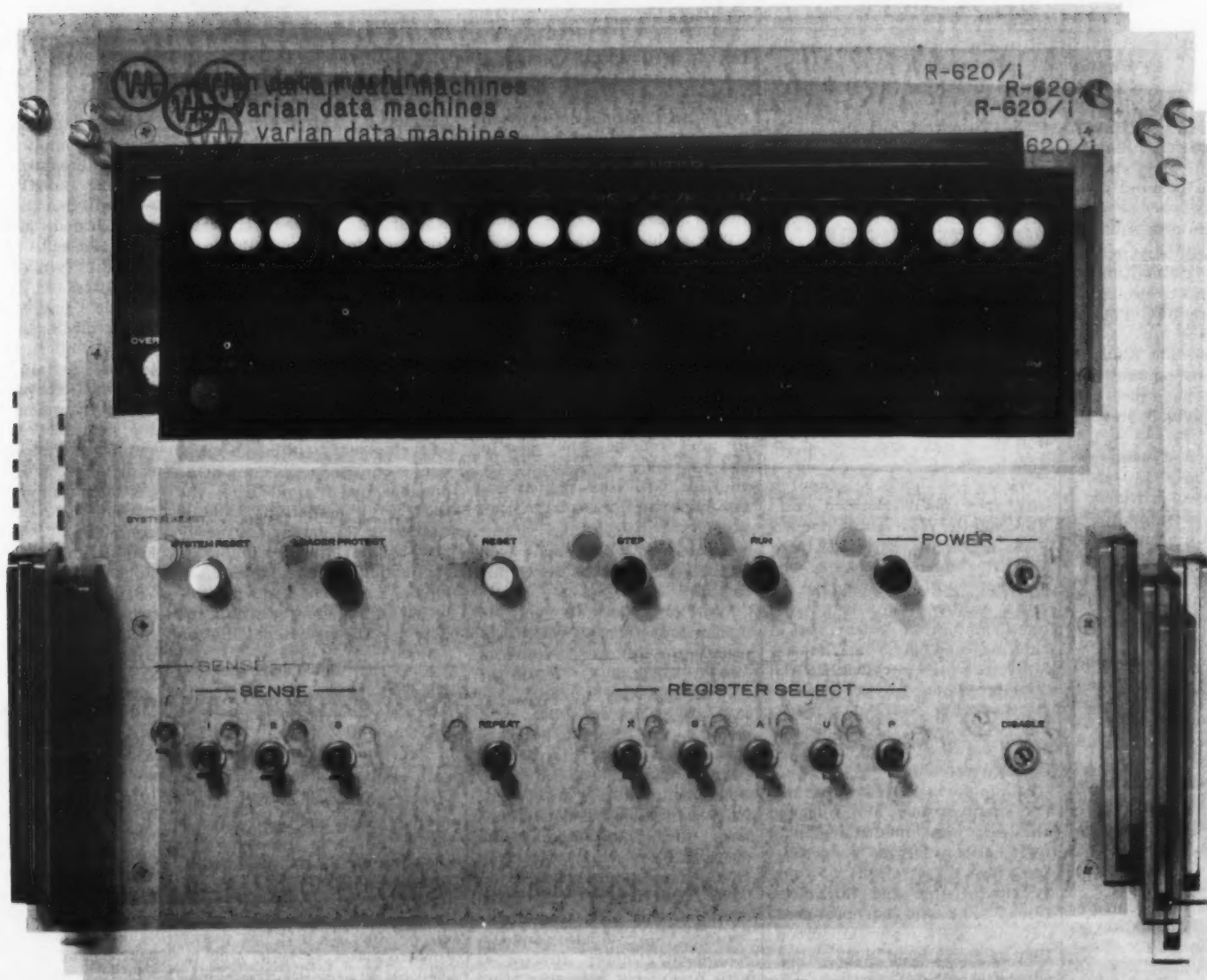
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# New Dimension Added for Blind With Use of Braille Terminal

CAMBRIDGE, Mass. — Engineers at the Massachusetts Institute of Technology have built and installed two more braille input/output terminals to allow blind persons to have access to

time-shared computers.

One terminal is being used by Michael J. Lichstein of Cincinnati, Ohio, to hold down a job as a systems analyst for a time-shared computer program used

in economics research. Lichstein is a 23-year-old graduate student at MIT.

The second unit, installed recently at the National Aeronautics and Space Administration's Electronics Research Center here, is being used by a blind programmer and mathematician.

Another terminal was demonstrated in October at a conference on the blind in computer programming sponsored by the Association for Computing Machinery at Cleveland, Ohio.

Earlier braille systems have also been built at MIT, including one used to permit simultaneous preparation of material in English and braille [CW, May 15, 1968], eliminating delays and the need for specially trained braille machine operators.

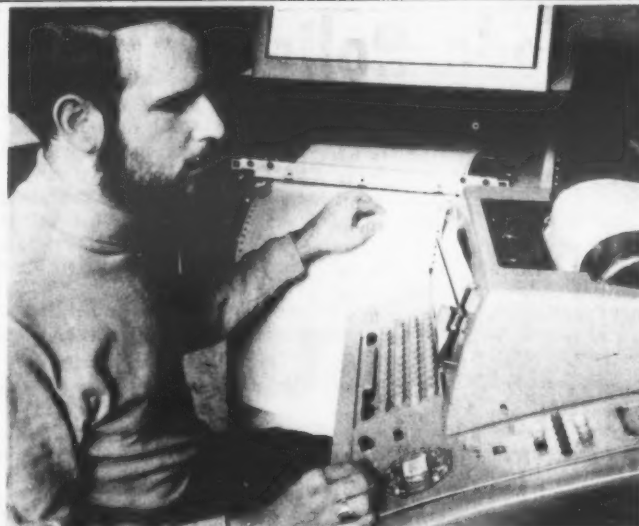
The problem with the earlier systems was that they were for off-line output only, and did not allow real-time communications with a computer.

The newer braille terminals include a standard teletypewriter and a braille embosser. Back-and-forth messages with the computer appear simultaneously in print on the teletypewriter and in braille on the embosser, allowing both the sighted and the blind to work on the same project.

Lichstein says he cannot overestimate the value of the system to him.

"Not only is it possible to model and estimate systems of equations, but a tremendous quantity of data is stored in the system and kept updated," he says. "This means that it is possible for the blind investigator to carry on his research independently or as a fully functional member of a group. The tedious problems of data collection, which are literally impossible for a blind individual, are to a large extent solved."

The new terminal was developed at the MIT Center for Sensory Aids Evaluation and Development. Center director is Vito A. Proscia, himself a blind engineer. Project engineer was



Michael L. Lichstein, a blind graduate student in economics at MIT, uses the braille input/output terminal.

George F. Dalrymple, a staff electrical engineer at the center. Design support was provided by Murray Burnstine, a consultant in mechanical engineering, and Ranulf W. Gras of the MIT Instrumentation Laboratory.

Heart of the terminal is a high-speed braille embosser originally developed in the MIT Department of Mechanical Engineering under Professors Robert W. Mann and Dwight M.B. Baumann and later developed further at the Sensory Aids Center.

Development of the high-speed braille embosser has been made possible by a grant from the Hartford Foundation. Demonstration of the embosser's usefulness to the blind, including its application as a computer terminal, has been made possible by grants and contracts from the U.S. Social and Rehabilitation Service.

To use the embosser as a time-sharing computer terminal several requirements had to be met. First, a complete braille code with all the computer symbols was defined, such that there is only one cell of braille for each inkprint symbol used by the computer.

Grade I braille is not usable as the numbers and certain punctuation require two braille cells. Further, certain symbols do not exist in Grade I braille. Likewise, Grade II braille does not meet the one-cell requirement. The result was that a modified braille coding system was developed.

A second requirement was that there be no modifications of the computer. The braille terminal had to look like any other terminal to the computer.

Still an additional requirement was that there be minimum modification in the terminal used.

## Module Said to Simplify Attaching 360 Peripherals

DAYTON, Ohio — A new channel access module, literally a "channel channel," is designed to simplify the task of attaching peripherals to the I/O channels of a S/360 (Model 30 and up).

The manufacturer, Capital Computer Corp., says the unit allows the user to modify his address assignments via program control.

The CAM/360-2 attaches to either a selector or a multiplexer channel and is said to be able to operate in single-byte, multi-byte, or burst mode.

Input to the module is adaptable to 8- or 16-bit parallel data sources. The unit has a peak rate of 1,000,000 byte/sec, the company says.

The unit features dynamic device addressing on a 360 channel, the firm says, providing a means of passing a submultiplex address, under full user control, on to the attached equipment.

Address assignments may be hardwired at installation or they can be user-modified under program control.

A single unit can serve many devices, with each having a unique address, or the unit can multiplex many I/O devices using a common address for all, the company says.

The unit is described as being mechanically, electrically, and logically compatible with the S/360 standard channel interface. Logically, it is said to provide all the addressing, selection, data transfer, control, status, and sense information required by the channel.

To the programmer, it is accessible through logical IOCS macros, physical IOCS channel programs in assembly language programs, or indirectly through the Camio subroutines.

Priced at \$3,000 in quantities of one to nine, the module can be delivered 90 days after receipt of order, the company says.

The firm has offices at 18 Mackoill St.

## Witness Calls For Suspension Of Votomatic

(Continued from Page 1)

error was obvious, since the system failed to count any "yes" votes on a bond issue. In another case, Mrs. Huggins explained, an "error" could be programmed into the system, and possibly go undetected.

The system holds a computer card in a pre-determined position, and the voter hand-punches it. It is possible, says Mrs. Huggins, for someone to alter the program with a "handful of cards" so that every fourth vote, for example, is "cast" for a certain candidate, no matter how the voter punched it. According to local experts, the system could also be programmed to "forget" the tampering, and pass the "logic and accuracy" test later.

Calling for a "totally perfect" vote count system, Mrs. Huggins chastised news media demands for faster counts as dangerous "to the preservation of our system of free and fair elections." She said her proposed national agency should screen the uses of technology when they affect society.

The Times echoed her sentiments, calling for adoption of "new laws and new standards" to assure that vote rigging will not occur

## FJCC Putting Emphasis on Quality

(Continued from Page 1)

will come for just one day. Arrangements have been made to use larger meeting rooms at several hotels in the event that the attendance at technical sessions exceeds the size of allocated rooms.

It is expected that few if any luncheon tickets will still be available when the conference opens. This problem is in part

due to the fact that the luncheon had to be moved from the International Hotel to a dining room at the Stardust Hotel which cannot seat as many.

More than 20 buses will be used full-time to transport attendees between hotels and exhibit areas. Buses between the exhibit areas will run at intervals of five minutes or less.

The conference runs from Nov. 18 to Nov. 20.



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# Toledo Police Forced Off System by Secondary Uses

By Edward Bride

CW Staff Writer

TOLEDO, Ohio — This city has temporarily halted use of its computer for its primary applications, tracing stolen vehicles and traffic violators.

The system remains on-line for payroll and other batch processing applications, but improper configuration and lack of understanding, according to a city spokesman, made the processor unavailable for most of the third generation applications.

A story in the *Toledo Blade* stated that "lack of confidence" by the police resulted in laxity in feeding up-dated stolen-car and traffic-violation information to the computer. But Assistant City Manager James Daken said that unavailability of core caused the lack of confidence and that improper configuration caused the unavailability of core.

Toledo's Data Processing Manager Fred Felzer explained that the city's Honeywell H-1200 is equipped with a storage protect

device, but that the police programs did not incorporate the device. As a result, when the computer was being used for any of the batch processing applications, it was unavailable for updating the police files.

In effect, this negated the multiprogramming feature of the computer, frustrated police and city officials, and eventually caused the shutting-down of the primary (police) applications.

The computer was leased in 1967. Police division use was

added in August, 1968, initially to help identify stolen vehicles, stolen license plates, impounded vehicles, and vehicles used in crimes, and to provide information on traffic violations, including motorists who ignored parking tickets.

However, the police programs were written two years ago, before the payroll and other batch-type programs. Felzer said that consideration had not been given to the fact that these latter programs required 20K and that

the 32K computer was to be operated in two 16K partitions. Since the storage protect was not utilized, and the police data was core resident at the upper extremity of its 16K increment, the result was the unavailability of the police information on a real-time basis. Thus, the "unavailability of core," lack of confidence, and resultant psychological resistance to using the computer for police work.

The primary applications have been off-line for over six weeks now, and Assistant City Manager Daken stated that the cost to the city would be about \$3,000 a month, based on \$7,667 rental.

The city has appointed a steering committee to examine the problem and recommend a solution. Comprised of city employees and volunteers from industry, the committee apparently does not have police representation in the form of a full member, although from time-to-time members of the police, traffic, or record divisions were to be called in to testify.

Daken stated that the city realized it had a problem over a year ago when it appointed the committee, but it was only recently that the police and the committee decided that the solution could best be reached by shutting down part of the computer. A report is due in mid-December.

## Separate Pricing Seen Cutting User Costs

CHARLOTTESVILLE, Va. — By stimulating competition among vendors, who can now offer to supply selected elements of a system, separate pricing should lead to lower costs and improved performance. This was one of the conclusions contained in a report on a government conference held here.

Participants in the Conference on the Selection and Procurement of Computer Systems by the Federal Government warned, however, that separate pricing could not be viewed as an immediate and unqualified boon. A

number of problems exist, the report noted.

For one thing, there is a lack of appropriate interface standards to insure compatibility among the products of different vendors. Another thing missing is the techniques for assessing vendor responsibility when the whole system breaks down. And a final deficiency lies in the area of enforcing the vendor to live up to his responsibility when his equipment malfunctions.

Participants in the conference agreed that a "systems integrator" kind of skill will be

needed if separate pricing becomes widespread. This function is essential to insure that "all elements of a computer system are properly integrated and responsive to the user's needs."

It was noted also that independent manufacturers should be encouraged to widen the range of their compatibility with other computer systems and support the development of interface standards.

In view of the growth in the number of independent companies producing a variety of new products, the user would be

helped tremendously by having access to a catalogue which described the products available, the performance claimed by the manufacturer, a validation of the actual performance, and an evaluation of the performance related to specific applications, the conference report said.

Finally, the conference urged that the government continue to support and participate in the work of the American National Standards Institute (Ansi). The National Bureau of Standards, it was stated, should embark on a well-publicized, fully staffed and fully funded effort to develop standard interface specifications that would satisfy the federal government's requirements.

## Human Relaxes, System Preempts Nixon

PHILADELPHIA — The management of WCAU-TV answered a lot of irate and accusing telephone calls after an electronic

programming guide preempted President Nixon for a bread commercial Nov. 3.

The system, according to a WCAU-TV spokesman, was programmed to broadcast the commercial at 10 p.m. (EST), and no one told it that the President was more important. Two seconds after the automatic commercial went on the air it was manually cancelled and the President's speech resumed.

The spokesman said that the system should have been set on "manual" rather than "lapsed time." Additionally, the spokesman said, a count-down on the

studio monitoring panel indicated that another message — the commercial — was about to be broadcast, and someone should have realized that the speech was not near completion.

It would have been possible, at any time before the commercial was actually broadcast, to intervene, switch the programmer to "manual," and preserve the speech intact. However, no one noticed the count-down, and moments later "Grandpa Stroehman" was seen selling his bread. The studio received several calls and letters accusing it of "anti-Nixon antics."

## Defense Work Interrupted By Students

CAMBRIDGE, Mass. — Demonstrating students stopped computer-related defense research for short periods of time at MIT during a three-day protest this month. The demonstration was peaceful, and both the students and the school avoided any serious confrontations.

The demonstrations were led by the November Action Coalition (NAC), a combination of 30 militant student groups from the Boston area. NAC demanded that MIT shut down seven projects funded by the Department of Defense, including:

- The Cambridge Project to develop computer methods in the behavioral sciences [CW, Oct. 22].

- Research on Mirv multiple warhead missiles at the Instrumentation Laboratory [CW, Nov. 5].

- Work on the ABM (anti-ballistic missile) at Lincoln Laboratory.

NAC claimed that the demonstrations were a success. In a statement, they said that it was "the first time that the movement has been able physically to prevent work from being done on a major war research project in this country."

Monday, before the demonstrations began, MIT obtained a court order against NAC which prohibited it from using "force or violence." But NAC said that it did not plan violence, and there was none.

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## 'ESL' Language Designed to Cut Costs and Increase Reliability

ROME — An experimental programming language, designed to cut costs and improve software reliability, was reported at the recent Nato Conference on Techniques in Software Engineering.

The language, called ESL (Extended Systems Language), was described by Edward S. Lowry, a programmer from IBM's Poughkeepsie, N.Y., development laboratory.

ESL uses a new class of objects called "ranges" (sets of data values). Declarations describing the ranges express program documentation in a formal way which allows the computer to thoroughly analyze the program flow. This relieves the programmer of much of the work in analyzing code.

### Range Declarations

Range declarations place constraints on the ways in which data can interact in a program. These constraints permit many things in a program to be implied and provide for recognition of various kinds of program irregularities. For example, a variable containing a number of dollars may be added to another variable containing dollars, but not to any other kind of variable.

Many ranges — such as dollar cost, part number, velocity, date — may be identified in a program. Data in any one of these general ranges may be included in a large program in variables, arrays, and structure subfields.

Features of ESL that assist the programmer fall into four categories:

design and specification, coding, debugging, and documentation.

□ The design and specification feature enables a programmer to test high-level models (expressed in terms of sets of objects and their properties) and to convert them easily to efficient coding.

□ The coding feature simplifies indexing, loop control, and text scanning, and eliminates minor "housekeeping" variables.

□ The debugging feature provides compile-time detection of errors such as adding a temperature to a velocity, comparing a time to a device type, subscripting a table of queued requests using an account number, or

failing to test for an end of chain.

□ The documentation feature provides expanded listings which give a description of the data being operated on at many points in the program.

The conference, the second sponsored by the Science Committee of the North Atlantic Treaty Organization, concentrated on the technical and scientific aspects of software engineering. Last year's conference in Garmisch, Germany, was a survey of the entire field.

Copies of the paper are available from the company's systems development division at P.O. Box 390, Poughkeepsie, N.Y.

DO [J IN] FILE;

IF [I →] DIRECT [J] [= '1' B] THEN

H = [I →] TRACKNUM [J];

...

END;

END;



A condensed list of executable coding statements is used to illustrate how ESL allows the computer to imply certain things.

## Chevy 'Car-puter' to Tailor Cars to Individual Tastes

DETROIT — A computer may soon help customers select their new car. The new system, called "Car-puter," is being designed by the Chevrolet division of General Motors, a company spokesman said.

The experimental system will recommend a car model priced, equipped, and even tailored to the individual's personal requirements and preferences.

When completed, the system will operate as follows: The customer steps up to a terminal and is asked a series of questions by the computer. The questions, in multiple-choice form, are shown on a 25-in monitor screen.

The answers are fed by leased telephone line to a rented IBM computer system, located in Union City, N.J.

The computer's files contain the latest information on current models, options, and prices. This data is used in "talking" with the customer and making a purchase recommendation for him.

When tied in with the company's distribution system, the Car-puter would be able to scan the dealer's inventory or stock orders to find a compatible vehicle. If none is available there, it could scan district, regional, or national inventories to facilitate faster delivery.

Car-puter could also reject orders because of incompatible options, or the unavailability of specified accessories, and relay the information back to the dealership.

Dealer orders could be transmitted and verified immediately

along with a projected build and shipment date, the company said.

Armed with the computer print-out on pricing and availability of options, the customer may also find himself better equipped psychologically to approach a salesman to make a deal, the company stated.

The dealership would benefit, too, according to the company.

The ever-increasing numbers of models, options, accessories, and pricing combinations when stored in the computer would give the salesman an instantaneous source of information.

Chevrolet emphasized, however, that the system was still in the experimental stage. There is no indication of when, if ever, it may be developed sufficiently for practical use.

## Temporary Punch Combos To Be Supplied by Victor

CHICAGO — An entire keypunch department can be supplied to computer installations under a new temporary help

plan offered by Victor Comptometer Corp.

Under an annual contract for modular staffing, Victor supplies both keypunch operators and keypunches as needed to handle peak or special loads. The plan, the company estimates, can cut a department's operating costs by 20%.

After studying the needs of a client's department, Victor determines the most efficient workflow, schedule, and volume. A supervised staff is then assembled from a pool of reserve talent.

Teams can set up an entire operation and then work with the regular office staff, the company said.

## Small Users Have Louder Market Voice This Year

NEWTON, Mass. — The small user represents a larger share of the market than a year ago, according to a report published by International Data Corp.

The top 100 industrial users saw the value of the computers which they control drop to 15% from 17% of all those used by U.S. based organizations in mid-1968, the report said.

Published in *EDP Industry Report*, a newsletter, the report points out that "the top 100 increased the value of their data processing equipment by 20% in the past year, and lists the top five users as General Motors, General Electric, Boeing, Ford and McDonnell-Douglas.

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## Editorials

### Patient Dead? Print 'Dead'

A "life and death" computer has been developed to help doctors determine exactly the moment of death of prospective heart-transplant donors, according to an Associated Press story carried in newspapers recently.

The story reports that the method of determining brain death with an electroencephalograph depends largely on the doctor's interpretation of brain waves. Interpretation of brain waves is subject to several sources of error, the story says. It then quotes Dr. Reginald G. Bickford, professor of neurosciences, University of California at San Diego and developer of the computer: "It is the job not for the eye, but for the computer."

The Cocoa Beach, Fla., *Today* headlined this story: "Computer Tolls Death Knell."

### Who Believes Computers?

You don't think anyone would accept a computer's verdict that you were dead without double checking? Listen to this story by columnist Paul Crume in the Dallas, Texas, *Morning News*:

A man and his wife drove to the airport to meet a relative and arrived after the relative's plane was due. The man inquired at the airline counter about the plane and was told that the plane had already landed and departed. The airline agent said he had gotten this information from "the computer."

Since the relative was not in sight, the man asked: "Where are all the people who got off?"

"The plane has come and gone," the agent insisted.

This discussion continued on and off for almost four hours, Crume reported, with the airline agent stating flatly that the computer showed the plane had come and gone.

They were still debating when the relative arrived and said his plane had been delayed by weather.



'Is This the Quiet, Efficient World of Data Processing?'

## Letters to the Editor

### Multi-Imager Printing Concept Not New Idea, Only Overlooked

It has been interesting to note several articles over the past few months concerning the printing of name and address files, labels, computerized letters, and finally, in the Sept. 3 issue, printing on blank forms.

The concept of multiple-image printing and that of printing on blank forms is quite an old one. The first use that I made of blank forms was some eight years ago in a situation similar to the one reported in your Sept. 3 issue. Since then this idea has been developed into a routine method of avoiding the long delivery times and high flat charges associated with custom continuous forms—particularly those used on an erratic and small quantity basis. This has been coupled with the multiple-image concept so that we have currently in hand a proprietary BAL program which enables us to do a large quantity of printing on this basis.

Using a fairly simple concept we are also able to economize on mailing costs as well as printing costs by printing eight names per sheet on a large square sheet of card stock, thus enabling us to post-print eight business reply cards. The return address on the back is preprinted when the continuous form is manufactured and the cost of these forms in large quantities is not very much greater than the cost of small quantities of cut stock. As a further refinement, if the initial mailing is to go any class other than first, the program enables us to print what is, in effect, 8-up so that after the first stack of jumbo cards is run through an offset printer (trimming the running costs by eight times) the final sheets can be trimmed into eight stacks which when placed one in front of the other revert the finished product to the original file sequence, thus avoiding the cost of hand sorting into Zip sequence.

You will be interested to know that this can be accomplished on a 32K tape system and the file arrangement overhead is very low. Also, this same program is capable of printing letters 1, 2, or 3-up, depending on the size of the letter, and printing paginated columnar information running in normal directory style from top to bottom by column.

I am glad to see that your publication is drawing attention to the long-neglected techniques which were available to first-generation computer users and are only now beginning to be popular. There are still many areas where the economics of ordinary business operations are grossly neglected. Since this particular area is our organization's field

of specialization, we are keenly aware and greatly appreciative of the growing interest in making the computer a business tool on the same down-to-earth profit and loss basis that must be met by every other element of business. It is heartening to see that the mystique of the computer is dying. However, it might be more helpful if your publication would recognize that these are not new and fabulous ideas, but the long overlooked basic economic necessities involved in operating a truly useful computer facility.

Robert L. Carroll

Data Systems Auditors, Inc.  
Philadelphia

No one said the technique discussed in the Sept. 3 story was new or fabulous. The story was simply intended to be informative. We think your letter is also informative. That's why we printed it. Ed.

### Hilton Site Selection Somewhat Meaningless?

Thank goodness they didn't choose the Waldorf! However valid your views may have been (editorial 10/15/69) concerning the program of ACM's Urban Symposium, those views were rendered meaningless by your absurd attempt to relate site (N.Y. Hilton) to content (guilt by association?). Nor did you offer any suggestions as to a more suitable location for a large conference of this sort. Shame, CW for such barefaced sophistry!

Nancy Mackta

New York, N.Y.

If the meeting had been held in Harlem or Newark, it might have been harder for the symposium to ignore the real urban problems. Ed.

### Editorial Cartoon Selection, Issue Placement Questioned

I would like to suggest a greater degree of compatibility between the editorial staff and the editorial cartoonist. It is a very rare occasion indeed when the editorial cartoon bears any relation to the copy of the paper.

Daniel J. Kubala

Chicago, Ill.

Editorial cartoons usually appear one week after the story to which they are related. This timing is made necessary by our deadline schedule. Ed.

Ed Zeigler of  
NCI Dallas tells how to find

# "Program maintenance Utopia"

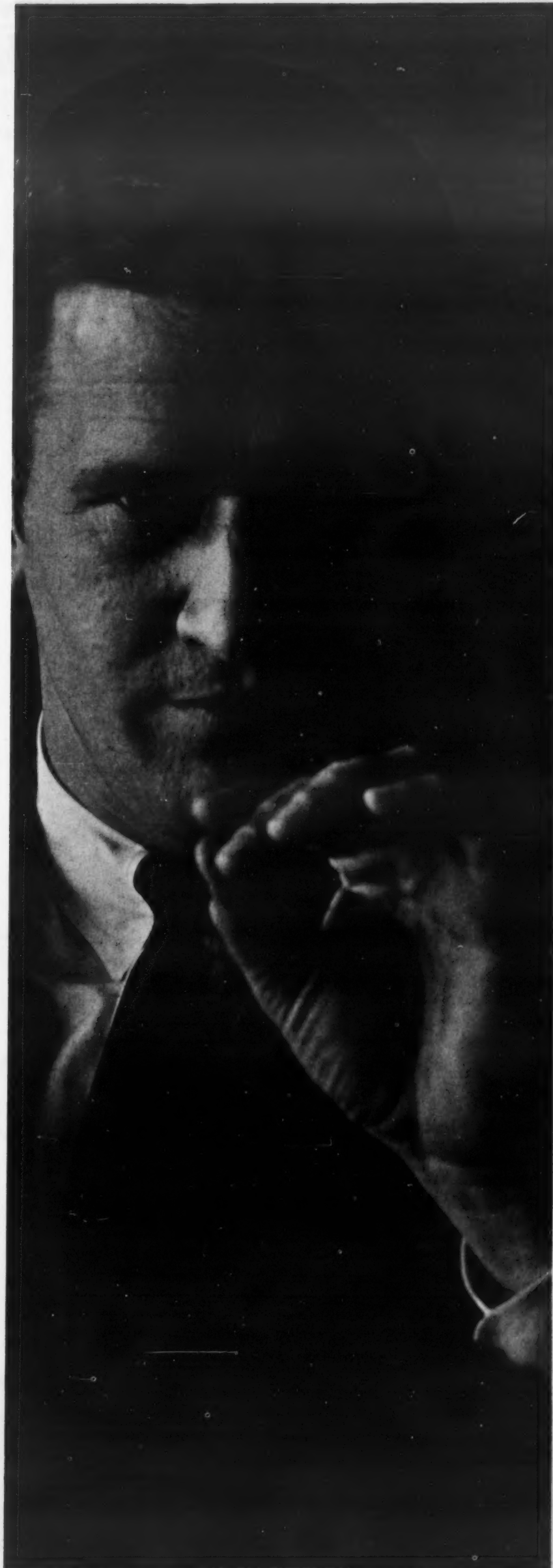
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# Burroughs Adds Card-Punch And Key-to-Tape Stations

DETROIT — Burroughs Corp., has developed a card-punch station and a key-to-tape station to add to its line of data-entry devices.

## A150 Key punch

The keypunch, designated the A150, operates similarly to other industry-compatible equipment. It uses the standard EBCDIC 64-character set, but adds the ability to reproduce any number of punches in a single column without destroying the punching mechanism. It also permits the operator to program multipunching, eliminating the need for the common use of the multipunch key for the preparation of algebraically-signed fields, according to the company.

The unit has two stackers, both operator-selectable. Printing in-



A150 card keypunch is designed as free-standing data input device.

terpretation is clearer, the company says, due to the elimination of the IBM-developed wire-matrix printing mechanism.

## Series N Key-To-Tape

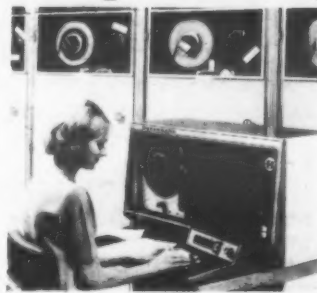
The N7000, the first of the

## New Products

Series N input stations to be announced, appears to be a keyboard-to-magnetic tape unit offering minimal features.

The basic configuration is one alphanumeric keyboard with appropriate function keys, an alphanumeric display of the actual character being entered, one field definition control program, and very simple controls.

Optional features, the company says, include the ability to transfer information from punched paper tape, or from



Series N keyboard-to-magnetic tape machine transfers information from source documents onto magnetic tape.

cards, directly onto a magnetic tape, letting the device act as an off-line converter; a high-speed printer for off-line output from magnetic tape; an adding ma-

chine (automated) for the accumulation of batch totals; and data communications capabilities.

## Prices, Deliveries

The A150 sells for \$4,990 and can be leased for about \$85 per month. Deliveries are scheduled for three months from date of order, according to the company.

The N7000 is scheduled for delivery this month, and leases from \$165 to \$277 per month. Purchase prices range from \$8,400 to \$12,200, the company says.

Burroughs is located at 6071 Second Ave.

## System Said to Operate With Any Tab-Size Card



## Card System 4000

VERNON, N.Y. — A device that allows a computer or tab equipment user to process only selected cards required for a particular run has been announced by Mohawk Industrial Laboratories, Inc.

System 4000 is said by the manufacturer to be able to operate with any tab-size card in use today, including the standard 80-column, magnetic strip, microfiche, or aperture types.

The firm claims that a mixture of cards can also be used with the system.

One System 4000 unit stores up to 4,000 cards that can be instantly retrieved either singly or in groups from an operator keyboard.

The company says that the system offers six-second-maximum retrieval from randomly filed cards, and automatic return to file of all cards not used during an operation. The company says the system has unlimited capacity, using multiple 4000 card capacity units. Odd-size documents can be stored and retrieved in tab-size envelopes.

The system is priced at \$7,400, not including options such as the visual readout unit. Deliveries are expected to begin in the first quarter of next year.

The firm is located at 1 Ward St. here.



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## Remote Terminal Validates Credit Card Purchases Via Atlanta Computer Complex

MIAMI SPRINGS, Fla. — A credit card validation, point-of-sale remote terminal can now be installed on-line to Electronic Computer Systems' Atlanta computer complex, according to ECS.

The device, called the Veridata 100, reads the familiar credit card, which has punched card holes, and automatically inter-

### Data From 16 Units Pooled Onto One Tape



Mohawk 9000 System

HERKIMER, N.Y. — Mohawk Data Sciences has added to its line of key-to-tape data recorders the ability to pool information from up to 16 keyboard units on one magnetic tape.

The basic MDS 9000 system includes, in addition to a maximum of 16 keyboard stations, a central controller (which functions as a multiplexer); and two tape handlers, with another five optionally available.

The keyboard unit includes a visual display of currently-addressed memory contents, program-memory contents, and the number of the memory currently addressed.

The central controller stores 10 format programs, with the operator able to select up to four at one time.

The same operator will enter, verify, and correct. Mohawk says that one advantage of this system is that underproductive operators can easily be spotted and retrained.

The 9000 system has facilities to allow the operator to transcribe cards, paper tape, and off-line magnetic tape to the permanent magnetic tape produced by the system. The 9000 can operate on-line with the keyboard, via communications, and can process incoming data from phone lines.

Mohawk is located on Palisade St.

### New Products

rogates a customer file each time a credit purchase is made.

The total process, completed in seconds, involves transmitting data signals over a telephone line to a remote computer or over a simple pair of wires to an in-house computer, setting in motion a number of steps in the credit sales business.

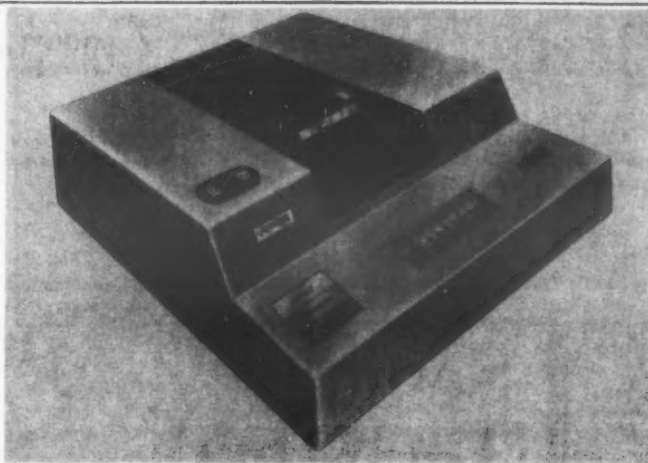
After determining that the credit card is not lost or stolen, the computer further confirms that the sale has not exceeded the account's maximum charge allowed, regardless of limit; that

the account is not in arrears; or that a hold on further credit has not been placed against the account.

Verification of the acceptability of a request to enter a charge sale is followed by the actual transaction that is entered into the remote unit by a sales clerk.

Next, posting to the customer master record, updating the total balance due and capturing the transaction is handled without further effort, according to the company.

The unit will print each trans-



Veridata 100 Credit Card Terminal

action on a sales slip inserted in the Veridata 100 at the time the entry is first made.

The device can be used with computers having communications capabilities, such as the Honeywell 200, IBM 360, Bur-

roughs 3500, and Univac 9300. Rental cost is \$49 per month. Delivery is four to six months, according to the company.

Electronic Computer Systems, Inc. is located at 4471 N.W. 36th St., Suite 201.

## WHAT'S REALLY HAPPENING??

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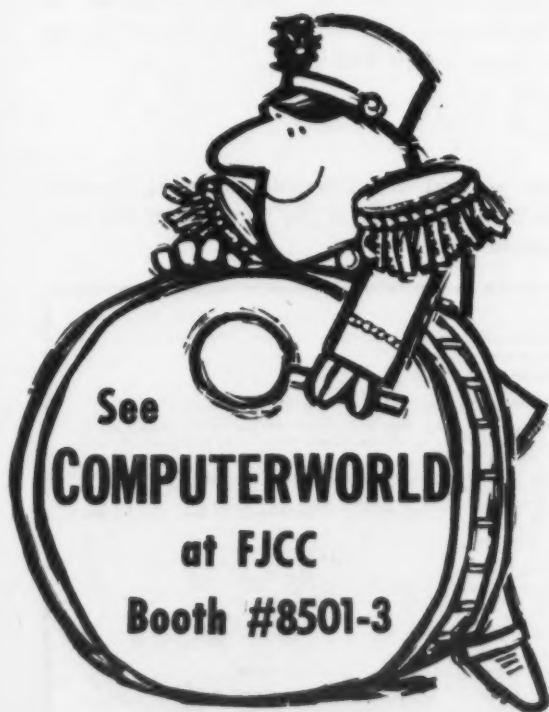
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## Disk Control Units Are Compatible With IBM 2311 and 2314 Drives

System 360 users need no longer depend on IBM as a source for controllers to be used with the 2311 disk drive. Both Information Storage System, Inc. and Potter Instrument Company, Inc. have recently announced units designed to replace the IBM 2314 controller.

### ISS 728

The ISS unit, the 728, offers complete data and hardware compatibility with S/360, the pany says. The company's recently announced 714, a 2314-compatible disk drive, has a claimed average access time of 32 msec and can be used with the controller.

The access times are said to be about 30 to 40 msec faster than the IBM unit.

End user sales are exclusively through Telex, but the company itself intends to continue OEM marketing. Earliest deliveries are scheduled for the company's 2311-compatible 701 this fall, and deliveries for the 728 and the 714 are scheduled for next spring, the company says.

The company is located at 10435 N. Tantau Ave., Cupertino, Calif.

All three units will be on display at FJCC booths 8107-8.

### Potter's Controllers

The DC-5841 announced by Potter Instrument Co., is compatible with the IBM 2841 storage control for 2311 drives. The DC-5314 is compatible with the IBM 2314 controller, the company says. Data rates and



708 Control Unit with 714 Disk Drives

## New Products

capacities are the same. The company offers compatible drives as well.

Detailed information was unavailable, but the company says it will have information at its FJCC booth 2100.

The firm is located at East Bethpage Rd., Plainview, N.Y.

## Graphics System Has Drum Plotter

ANAHEIM, Calif. — The off-line graphics system 900/100 combines three new products of California Computer Products Inc.

The system includes a magnetic tape unit mated to a general-purpose controller, which together drive the new drum plotter, the company says.

The Model 937 magnetic tape unit is a read-only device. It is designed to be operated with, and is physically housed in the 900 controller I/O section.

The seven-channel configuration allows switch selection to one of three tape densities (200, 556, or 800 bit/in.)

Read speed is 37.5 in./sec.

The unit base price is \$17,520, or \$660 per month on lease, the company claims.

The Model 900 controller is designed to accept data from magnetic tape and is capable of driving all the company's plotting units.

The controller is a nine-bit, binary-word, stored-program device with a 2 μsec memory cycle and up to 32K words of core memory.

Program loading is accomplished by means of a serial tape cartridge unit, which can also serve as a temporary data storage area. An endless tape loop of up to 150 ft is contained in each cartridge.

The controller is priced at \$17,000, plus \$4,000 to \$8,000 for the plotter interface. Rentals are from \$680 per month for the controller and \$160 to \$200 per month for the interface on lease, the company says.

### The Plotter

The Model 1136 digital incremental drum plotter includes the basic 36.5-in. drum with an operator-interchangeable 13.5-in. drum. All electronics are contained within the plotter cabinet, according to the firm.

The unit operates in a variable data rate format. Drawing formats up to E-size (34 in. by 44 in.) can be accommodated with the larger drum. Roll size drawings can also be made.

The 1136 is priced at \$22,720 or \$880 per month on lease. One-year service contracts are included in the base price of each unit.

Calcomp is located at 305 N. Muller St.

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## 'Next Panel for the Roast Beef Button, Mrs. Modern'

FORT LAUDERDALE, Fla. — The day when computers take over our simplest daily routines moves closer. Grocery shopping is already well on the way to becoming an automated process, according to Robert Loomis, vice-president of Computer

Food Stores, Inc. Convenience and simplicity is the idea behind the new computerized stores, said Loomis, whose company will soon begin construction on two sites in the Fort Lauderdale area.

The stores are designed to en-

sure that the customer will never have to leave her car. Circular in design, the drive-in stores will have four customer panels, each with over 200 illuminated buttons.

Each panel is designed to be pulled close to a car window.

Each button will have a brand-name and a picture of the product.

Products will be divided into six to eight major categories, each color-coded to make selection easier. For instance, beverages might be colored red and

dairy products blue.

A red light goes on behind the button as a product is selected. To account for mistakes, the board has an "enter error" button which the customer presses before pushing the button of the product she doesn't want.

When she finishes her order, she presses an "order complete" button, and the computer takes a total.

In the meantime, an inside attendant assembles the order. An outside attendant takes the packaged order to the car where the customer pays or charges it on her credit card.

The first of the new computerized convenience stores is expected to be open by March, 1970, Loomis said.

## Lack of Hands Proves No Hindrance Running Computer

WATERTOWN, Mass. — A console operator has to use his hands a lot, pushing buttons, handling cards, mounting tapes, etc.

But Michael J. Connolly of Watertown has no hands.

Connolly, 31, who runs a computer for the information systems department of the B.F. Goodrich footwear division, operates his RCA 3301 with steel hooks which replaced his hands three years ago.

And his skill, despite his alleged "handicap," continues to improve.

"He's a good console operator. The fact he doesn't have hands doesn't handicap him at all. He certainly has potential to do higher level work," according to Edward Hodge, department manager.

Connolly, one of seven operators, is rated by management "as good as any of them."

In addition to the computer, the peripheral devices include 11 tape stations, card reader/punch, and a line printer.

The 200-lb, six-footer arrived in this country from Ireland in November, 1962. He was mar-

ried in July, 1966.

Four months later, tragedy struck. Connolly's hands became jammed in an industrial machine and were so badly crushed they had to be amputated.

During 11 months of recuperation, he was fitted with the steel hooks and taught how to use them. Among his instructors was Harold Russell, famed disabled

World War II veteran and chairman of the President's Commission on Employment of the Handicapped.

Russell taught Connolly — who had driven before the accident — to drive a car with hooks.

An instructor at the Cardinal Cushing Rehabilitation Center at Holy Ghost Hospital, Cambridge, Mass., thrust a pencil

onto the end of a hook and told him to write until the scratches made sense.

And write he did. In May, 1968, he proudly affixed his signature to naturalization papers making him an American citizen.

"You know," he said recently, "I think my penmanship is better than it was before."

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## Ocean Driller Needs Computer To Stay on Site

PAPEETE, Tahiti — The *Glomar Challenger*, a uniquely equipped ship used for drilling holes in the ocean floor, is steaming toward this Pacific port on its eighth cruise of a recently extended scientific expedition to learn more about the earth. The ship is expected to arrive Dec. 5.

The Deep Sea Drilling Project has been extended for 36 months from its initial termination date of June 30, 1970. Sponsored by the National Science Foundation, the project is aimed at learning more about inner space — the history and origins of the ocean basins and of the continents, and about the processes that have led to their formation and modification.

The project involves drilling into the ocean floor and retrieving samples of sediments that have rained slowly for millions of years. To date, holes up to 3,230 feet deep have been drilled at 66 sites in the Atlantic and Pacific oceans, at water depths up to 20,140 feet.

One of the things that makes this project possible is a highly sophisticated positioning system. Special electronic and computer equipment controlling the operation of side thrusters and the ship's regular stern propellers enables the ship to remain over a drilling site.

# Proposition from a fast girl.

Hi, I'm Sandra "X", and I have a proposition for you single font fellows.

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We girls are tired of punching cards. Keying

tape. And retyping source documents for older generation readers.

So why not get rid of those keyboards, you naughty boy.

Think keyless, and I'll show you some real speed.

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## Concerned FCC Delays Proposed Telpak and TWX Rate Increases

WASHINGTON, D.C. — Proposed rate increases by the American Telephone and Telegraph Co. for its Telpak and TWX communications services recently were ordered suspended by the Federal Communications Commission for the maximum allowable delay of 90 days.

The proposed increases could have cost computer data users up to 300% over existing rates.

In announcing the suspension to Feb. 1 of next year, the FCC said that the Telpak rate hikes, which would have added an estimated \$46 million to AT&T yearly revenues, should be deferred "in view of the substantial increases [that] the company

now proposes..."

Telpak lines provide facilities for high-volume point-to-point communications in various forms including data, voice, teletypewriter, and facsimile.

The proposed Telpak increases were part of an overall filing submitted by AT&T to the FCC in Oct. that also included higher TWX (teletypewriter exchange service) rates amounting to \$5 million annually.

The TWX rate hikes were also suspended for 90 days and in addition the court ordered a new, separate hearing to be held on the current status of TWX service.

In commenting on the TWX

### COMMUNICATIONS

increases, the FCC said it "noted with concern" the fact that customer equipment cannot presently be interconnected "in the same manner and to the same degree" as is presently permitted under tariffs providing for access to the switched message network.

Industry sources felt that the reference dealt in part with the fact that customers can presently connect their own modems to the switched network while this type of interconnection is not now allowed under existing TWX tariffs. No date was set for the TWX hearings.

## Transmission Using Cable TV Explored by IIA

WASHINGTON, D.C. — Potential methods of using cable TV facilities to transmit information directly into homes are being explored by the Information Industry Association (IIA). The results of the study will be submitted to the Federal Communications Commission (FCC).

The IIA was formed in 1968 to serve firms with proprietary data bases that market access to their available data.

According to Paul Zurkowski, executive director, the IIA is interested in ideas on utilization of CATV facilities for computer access.

"Computer users will be primary customers of our members' proprietary data bases, and we are interested in their ideas," Zurkowski said.

### Prepare Position Paper

The IIA will use the information submitted to prepare a position paper for the FCC on the projected data transmission uses of CATV facilities. Specifically covered will be products and services that are, or may be suitable for marketing through CATV.

The association anticipates that such products as facsimile and data terminals will be included.

The IIA, in requesting responses from its members, issued a memorandum that said, "Our reply comments should contain as much information as possible to create an awareness within the commission of the scope of our industry."

Zurkowski said that the FCC has already granted one extension on the submission of the IIA position paper and that those interested in presenting their opinions should mail them to the IIA before Nov. 24.

Interested parties can contact the IIA at 1025 15th St., here.



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COMPUTERWORLD

## education

### System Compiles Scores, Diagnoses Math Troubles

PORTLAND, Ore. — A computer-scored, multiple-choice test in which "wrong" answers are more important than correct ones is being used to isolate trouble spots in arithmetic for sixth graders in the David Douglas School District.

Three years ago, curriculum specialists searching for possible sources of difficulty in mathematics compiled a list of 196 concepts in 25 different areas that could lead students astray. They ranged from not knowing how to approach specific problems to an inability to identify the problems.

District curriculum director E. Walt Ide, assisted by four math teachers, then set out to develop an evaluation technique that could be performed on the school district's IBM 1401, that would provide a list of the students' problems in a matter of hours, and that would allow corrective measures to begin immediately.

The result, now copyrighted, is the David Douglas Diagnostic Mathematics, 6th Grade, testing plan (DDDM6), said to be able to obtain results on a class of 30 students in less than 10 minutes.

#### The Right 'Wrong' Answers

The 89-question test appears to the student much the same as any other multiple-choice examination. It differs, however, in that each question has had built into it carefully designed "wrong" answers to help pinpoint trouble spots.

Each of the 196 major faults is included in the test in at least six places, making an allowance for the possible honest mistake. The student must miss more than 50% of the questions on any one concept before the computer flags the area for special attention.

#### Produces Four Profiles

The results are indicated on four printouts. First, each test is evaluated in terms of the individual student's response to the questions. A separate card is printed to indicate any of the 196 deficiency areas in which he needs help.

Then, after evaluating the students individually, the system compiles lists of pupils needing help in each area. This facilitates breaking the classes down into groups of students with similar problems.

A graph of the entire class is then produced, showing a comparison with the norm for the entire school district in each of the areas.

Finally, the system can print out a complete analysis of all sixth graders in the district, showing how they average as a whole in each area.

Ide contends that they have only scratched the surface of rapid-evaluation procedures. He feels that the technique could be applied profitably to any area of study involving individual skill, such as reading.

Already follow-up tests in math are under consideration. According to Ide, "A student with a low score in any area could be given the 'splinter' test which would further reveal the exact cause of his problem."

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## Bucknell, Ohio University Upgrading Computer Facilities With NSF Grants

WASHINGTON, D.C. — The National Science Foundation (NSF) has awarded grants totaling \$475,000 to two universities for expansion and improvement of their computing facilities.

Bucknell University, Lewisburg, Pa., received a \$395,000 grant that will be used primarily for the purchase of hardware, according to Dr. Edward F. Staiano, director of the school's computer center.

Like most NSF grants, the amount will cover a three-year period, although a major portion of the funds will be consumed during the 1969-1970 school year.

It is hoped that this financial assistance will enable Bucknell

to consolidate its computer services so that eventually all administrative, research, and academic work will be done on one system.

In addition, Bucknell will cooperate with Susquehanna University and other neighboring schools, connecting them via remote terminals to the Bucknell computing facility.

Toward this end, Susquehanna has received an NSF grant of \$20,000 for the purchase of terminal equipment.

The Bucknell computing center was begun in 1961 and was partially funded by an initial NSF grant of \$25,000.

A smaller grant of \$80,000 will

go to Ohio University.

The money will be used by the school's computer center to pursue research leading to a decentralized computing system for the university.

The proposed installation of terminals will permit remote access to the school's central 360/44 from classroom buildings, the library, and possibly from student residence halls. Installations are also planned for the school's branch campuses.

The two-year grant is the second NSF award to the center, under the direction of Robert W. Lilley.

The center is available to the faculty and students for use in education or research activities.

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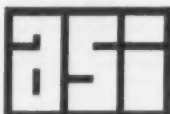
ASI-ST is a nonprocedural language compiler that processes multiple jobs accessing one or more data files in parallel. Its efficiency in compiling and executing many jobs concurrently is a primary built-in design characteristic. As an illustration, the degree of simultaneity achieved by ASI-ST on a machine as modest as an IBM 360/30 (DOS) with 32K yields a throughput much larger and faster machines operating in a multiprogramming mode can't approach... unless, of course, such installations have ASI-ST! Because ASI-ST produces object programs resembling those traditionally tied to assembly language code, its performance is further enhanced. By contrast, the more common interpretive and table-driven file management systems perform poorly. ASI-ST's modularity makes it the focal point of a comprehensive management information system.

#### WHO DEVELOPED IT

ASI-ST is the direct outgrowth of more "hands-on" experience in successfully developing more predecessor systems across a wider variety of computers than any other software firm in the industry. Examples of packages that the ASI-ST development team members have played major roles in developing include MARK I, MARK II, MARK III, SDS MANAGE, ASI MANAGE, FRUGAL, and the general-purpose information retrieval and report-preparation system currently used by the Office of the Secretary of Defense. In addition, members of the development team participated actively in the development of six COBOL compilers and three FORTRAN compilers.

The blend of talent, disciplines, and experience reflected by these accomplishments has resulted in a general-purpose software product that is THE state-of-the-art tool for business data processing.

For further information on how ASI-ST can help you, contact:



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## New Literature

A six-page folder describing and illustrating Ultronic Systems Corp.'s Time Share Multiplex Units and how they permit expansion of time-shared computer systems is available from the company at Mount Laurel Industrial Park, P.O. Box 315, Moorestown, N.J. 08057.

An eight-page, three-color brochure describes GE's new inventory management system. It includes illustrations of simplified charts reflecting inputs, data files, and outputs and is available by writing the General Electric Information Systems, Bldg. 6-207, Schenectady, N.Y. 12305.

A new brochure entitled *How*

*Equipment Leasing Can Help You*, offering guidelines on the feasibility of leasing, has been issued by the Cavanagh Leasing Corp. Copies may be obtained by writing to J.R. Rodfong, Vice-President, Cavanagh Leasing Corp., 825 Third Ave., New York, N.Y. 10022.

Boothe Resources International, Inc. has issued a brochure describing its services, including technical and commercial software, systems analysis and programming, computer education and training, peripheral equipment marketing, marketing consultation, and personnel recruitment. BRI's address is 3435 Wilshire Blvd., Los Angeles, Calif. 90005.

## Six Systems Seminars Scheduled

**COLORADO SPRINGS, Colo.** — A six-pronged program of seminars and workshops in various phases of systems analysis is being conducted on a staggered basis in several major cities.

The programs include:

- Fast Start in Systems Analysis, Phase I, five days, \$300.
- Systems Theory Forum, Phase II, one day, \$65. Prerequisite: six months' systems experience or Phase I.

• EDP Systems Analysis Workshop, Phase III, three-days, \$185. Prerequisite: one year's experience in EDP systems analysis and design or Phases I and II.

• Systems Documentation Workshop, Phase IV, two days, \$125. Prerequisite: one year's experience in systems analysis or Phases I and II.

• Systems Leadership Laboratory, Phase V five days, \$395. Prerequisite: two years' experience in systems, 75% completion

of Systemation's professional or basic systems course, or completion of Phase I and six months' systems experience.

• Internal Systems Training Seminar, one day, \$65.

A schedule of dates and locations for any of the above programs plus information on enrollment and accommodations may be obtained from Tony Raitz, Systemation, Inc., P.O. Box 730, Colorado Springs, Colo. 80901.

## Review Courses Ready CDP Contenders

**WASHINGTON, D.C.** — Review courses for the DPMA certificate in data processing examination will be offered in the Washington, D.C., area from Nov. 22 through Feb. 12 by Computedics, Inc.

Acting independently of the local DPMA chapter, Computedics will offer courses in computer programming and software, mathematics, systems analysis and design, statistics, data processing equipment, accounting, and principles of management.

Each course will meet weekly

for 10 weeks and will provide 20 hours of instruction in preparation for the exam. The fee for each review course is \$275, including all necessary materials.

According to the firm, the courses are especially designed to comply with the official Certificate in Data Processing Study Guide, published by the DPMA.

In addition to the seven full-length courses, the firm will offer corresponding one-day "brush-up" seminars, featuring more compact instruction in the areas covered by the review courses.

Cost for the seminars, to be presented from Dec. 27 through Feb. 7, is \$50 each.

The seminar series is not confined to local presentation. Computedics President Reid Henderson says that the series can be presented "anywhere that interested companies or organizations wish to make it available to their employees."

Washington area sessions will be held at the Sterling Institute.

Further information may be obtained from the company at 1629 K St., N.W., Washington, D.C. 20008.

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# Professionals for Peace Active in Moratorium, FJCC

NEW YORK — As a result of disrupting a meeting at the Spring Joint Computer Conference, the Computer Professionals for Peace (CPP) will have a speaker on the "Computer

Related Social Problems" panel at the FJCC.

At the spring conference, members of CCP repeatedly interrupted speakers at a session entitled "Urgent: Increased Dialog With Society." They charged that the speakers were avoiding the important, relevant issues, a charge supported by many observers, including Dr. Herbert Grosch.

Donald Lebell, chairman of the FJCC "Computer Related Social Problems" panel attended the spring meeting. "It was my first exposure to the group," he said. "They fit neatly into what I was looking for for my panel. I wanted someone who had personal experience with dissent; someone who had been on a picket line but who also had a base in the computer profes-

## Societies

sion."

So Lebell asked CPP to recommend a speaker, and the group suggested Edward Elkind, CPP co-chairman. The panel session will be held Wednesday night, Nov. 19, followed by a working session the next day.

### CPP Accuses Honeywell

CPP was active during the Vietnam Peace Action Day, Oct. 15. The group led a demonstration of 100 antiwar protestors at a Honeywell office here. Contacted for their reaction to the incident, Honeywell officials declined comment.

Elkind explained that Honey-

well was chosen because it makes more money from the Vietnam War than does any other major computer company. "We were appealing to computer professionals who work for Honeywell not to ignore the fact that Honeywell is contributing to the destruction of Vietnam. Those working for large corporations must not isolate themselves from the other activities of that company," he explained.

Honeywell makes 25% of its profits from bombs and other ordnance, according to CPP, more than it makes from computers. CPP also charges that Honeywell manufactures a particularly inhumane weapon, the Rockeye antipersonnel cluster fragmentation bomb, a device said to cause severe and usually fatal internal injuries, but only

limited property damage.

### Setting Up Service Bureau

On another front, two people, Paul Millstein, CPP co-chairman, and Stuart Davis are working full-time for CPP to set up a service bureau. "We want to use our talents to aid other organizations on the left," Millstein explained.

So far the service bureau has designed a computer-aided mailing system and has used it for the American Civil Liberties Union and *The Guardian*.

Millstein reports that CPP chapters are being formed in six other cities: Boston, Los Angeles, San Francisco, Washington, D.C., Philadelphia, and Poughkeepsie, N.Y. In New York City, CPP is at P.O. Box 1597, Brooklyn, N.Y. 11202.

## Univac Pioneers Plan To Reminisce at FJCC

LAS VEGAS — The Univac Pioneers, individuals who worked with Univac I or II systems, will hold their second gathering at the Fall Joint Computer Conference.

Billed as a "fun and fellowship reception," the meeting will be held in Room C, South, of the Sahara Hotel from 5 to 7 p.m., Nov. 19.

The Pioneers' first reunion attracted about 150 at the Spring Joint Computer Conference in Boston.

Those interested in attending should contact Noel Zakin at the International Hotel here.



Call for Papers

1970 IEEE SYSTEMS AND CYBERNETICS CONFERENCE, October 14-16, Pittsburgh, Pa.

Theme for the conference is "Systems for the Seventies." Session topics will include artificial intelligence, cybernetics, biomedical, learning and teaching, information, and urban and public systems.

Abstracts of about 1,000 words must be submitted to Prof. A. Lavi, Carnegie-Mellon University, Pittsburgh, Pa., 15213 by April 15, 1970. Final manuscripts for publication in the conference record will be due Aug. 15, 1970.

EIGHTH ANNUAL CONFERENCE ON COMPUTER PERSONNEL RESEARCH, June 23-24, New York, N.Y.

Conference sponsor, the special interest group on computer personnel research (SIG CPR) of the ACM, is soliciting papers for either spoken or workshop-format presentation.

Emphasis is on research, development, case histories, or findings in the following areas: selection criteria and instruments for computer personnel; training and upgrading techniques including aids for computer assisted instruction, training sources, standards, and curricula; job content, specifications, and trends; motivation, satisfaction, and mobility of computer personnel; performance evaluation techniques; and approaches to supervision and management of a computer installation.

Drafts of 600 words or more must be submitted by Feb. 1. Authors will be notified of selection by March 1.

Preliminary notification of intent, requests for additional information, and all materials should be sent to Robert A. Dickmann, Program Chairman, SIG CPR, The Johns Hopkins University, Applied Physics Laboratory, 8621 Georgia Ave., Silver Spring, Md. 20910.

## Book Reviews

*Introduction to Computers*, by Keith R. London, Brandon/Systech Press.

This book gives the reader a nontechnical account of the computer. It is aimed particularly at the modern businessman faced with the problem of assessing the role of the computer in his organization who wishes to use the full capabilities of this powerful tool with a minimum of internal difficulty and who wishes to acquire sufficient knowledge to evaluate the diverse proposals of technical and management personnel, manufacturers, and other suppliers in the data processing industry.

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FROM: Bob Dilks  
RE: Recruiting

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Position requires: BS, prefer MS, in a Science, with two years management experience; knowledge of advanced mathematical and statistical analysis; IBM 360 background; experience in the entire EDP system design and installation cycle — from problem definition to conceptual design through installation of user manual procedures.

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SYNTEX CORPORATION

November 19, 1969

Page 21

**Problems of Conversion - Part IV****System Users Should Anticipate Conversion Problems**

By Peter L. Briggs  
CW Software Editor

Some users have experienced the corporate shock of converting from one computer system to another. They are aware of the tremendous problems inherent in such a move. The previous three parts of this series are a guideline for those users who have not been through this type of conversion.

Obviously, if major problems occur, there has been a lack of planning. Most corporate executives probably do not have any real feel for the complexity of any reasonably integrated data processing system within a company.

With this ignorance, they cannot plan properly, cannot take proper preventative steps, and cannot explain the reasons for the disasters that continue to occur.

**Management Orientation**

From a management standpoint, many things can be done to prevent the occurrence, or recurrence, of conversion disasters. Proper selection of computer systems, proper use of modern computer languages, better training of personnel, and better awareness, on the part of corporate executives, of the importance of computers in their own companies would all tend to eliminate such problems.

What languages should one use, and why? What ways can be implemented to avoid losing that magic "compatibility"? How can a user, without large expenditures, provide protection for himself?

This is the final section in a four-part series. It deals with the continuing problems of the user who has already been through a conversion. The techniques for avoiding a repetition of these problems have been discussed many times, but little has been done to present the rationale behind each possible course.

Computerworld thanks its readers for contributing much of the material and guidance necessary to prepare this series of articles.

**Training Important**

Though it must, by nature, be expensive, proper training of middle management in the careful use of computers pays off in big savings. If the same care that goes into corporate mergers were to be used in planning new uses for computers and ways to implement them, then the problems would probably become insignificant.

Careful system design, always a rather scarce commodity, can eliminate many future problems by allowing for more variation in implementation without destroying the integrity of the system.

This type of thinking, using the most recent buzzwords such as modularity, re-entrancy, linked logic and the like, does require retraining. The types of system analysis used over the past 20 years are no longer suitable for effective system design.

More technical knowledge is

required, not to make the job easier, but to make the eventual system design workable. Maintaining systems becomes very simple if they are well designed. Company plans, today, are based on a more long-term basis than was previously the case. The

investment in a large software system can exceed \$4 million, making it important to write off and use such projects over longer periods of time.

**Technical Possibilities**

Many people have been spouting off about the savings possible with standardized languages such as Cobol and Fortran. This viewpoint has always been a double-edged sword, from the user viewpoint.

The price paid for standardized languages, as we know them today, is the sacrifice of advanced or new features.

Most companies cannot afford the loss of such capabilities, when they are being constantly

pressured to perform more and more work on existing computer facilities. These "tricks and gimmicks" can, frequently, save huge amounts of work and computer time.

Languages like Cobol seem to suffer from a general type of problem known as "stodginess." The language cannot respond, with any real speed, to the changes in the nature or ordinary data processing. It now takes years to introduce much-needed capability improvements into the language, such as decision tables, new data management techniques, and multiprocessing.

(Continued on Page 26)

**Service Runs With IBM 360 OS and DOS**

NEW YORK — In apparent response to IBM's unbundling, Information Standards, Inc. is now offering a complete systems generation and maintenance service for both OS and DOS customers on the S/360.

The service includes on-site consultation designed, according to the firm, to provide the optimum generated operating system for each customer's needs.

Specifications include the desired languages, the required sorts and utilities, selection of type and size for the supervisor, optimization of the I/O routines,

and development of the macro library.

Because, after Jan. 1 1970, users will have to pay for IBM systems engineers to generate their operating systems, the service is provided on an ongoing basis.

Outside estimates indicate that the average user will spend some 10 to 12 hours of machine time and about 40 hours of man time in preparing a system for OS. The figures for DOS appear to be about one-third of the OS figures.

Continuous testing and maintenance are provided, the company says, for all software included.

As new IBM Product Temporary Fixes (PTF) become available for relevant routines, they will be automatically supplied to the customer. As new versions of major routines or new operating systems become available, these also will be interfaced into the customer's operating system, the company says.

The company is located here at 295 Madison Ave.

**Largest Committed Time-Sharing System Being 'Shown' at FJCC**

PALO ALTO, Calif. — What is said to be the largest committed time-sharing system ever assembled is being shown, by picture, only, at the FJCC.

The Interaccess Corp. supervisor of multiprogramming, multiprocessing, interactive time-sharing system (Summit), consisting of a Control Data Corp.

3800 with a multitude of miscellaneous peripheral equipment, will be seen through the use of a camera with a wide-angle lens.

Program areas up to 1.3-million words are available by arrangement on the 900 nsec 3800 system. A CDC 1700 processor is used to handle I/O operations. Languages supported include

Fortran IV, Super Basic, Cobol, Algol, and Compass. An additional CPU, operating as a multi-processor system, is available on demand for special large jobs, the company says.

Charges on the system are billed entirely as the system is used. The company says that the user pays only for the precise time on

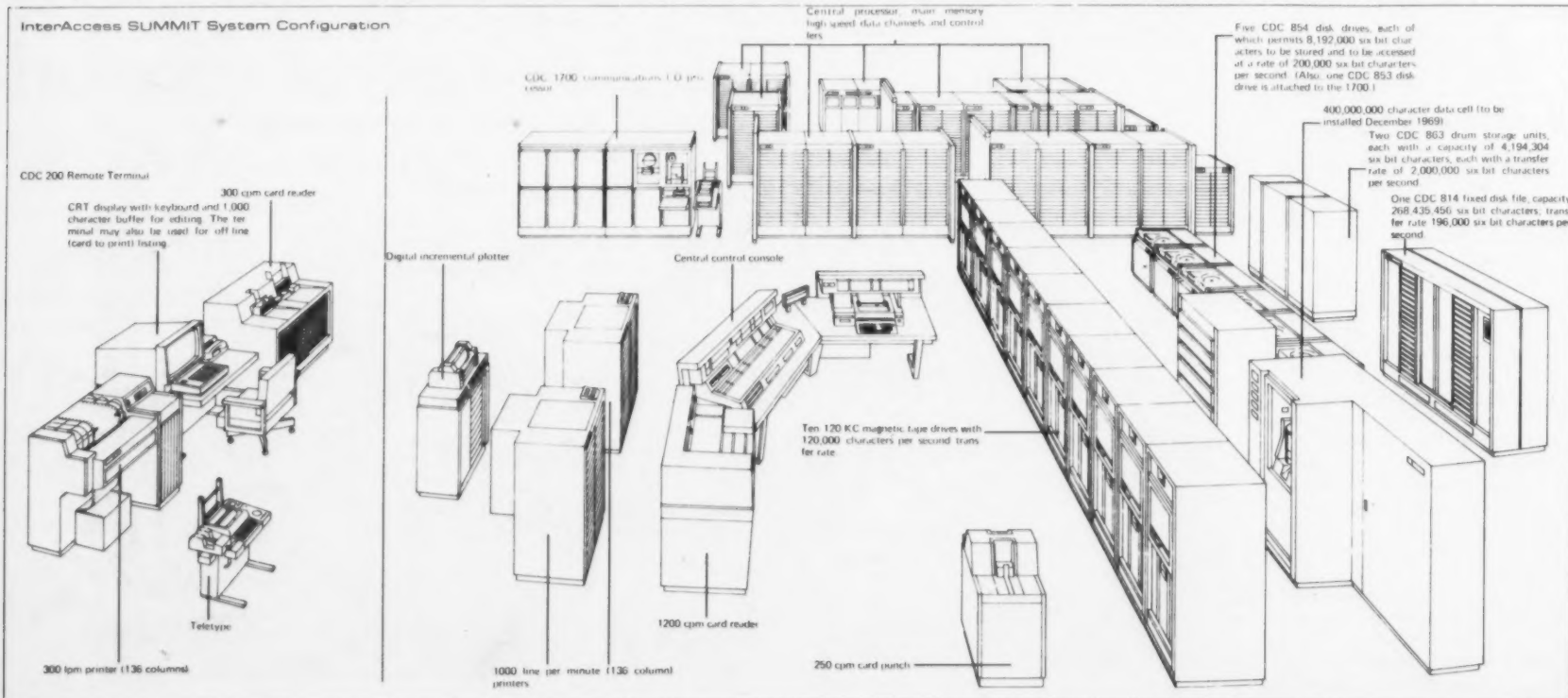
the precise devices that he actually uses.

Data storage is charged at 10 cents per 1,000 characters.

The company's plans, according to Art Dana, Interaccess executive vice-president, include setting up a worldwide communications network in order to utilize the machine fully.

While users in the U.S. are sleeping, users in Japan or the Philippines could be using the system economically, Dana says.

Information about the system will be available at booths 22005 and 22006 at the Sahara Hotel exhibits at the FJCC. Interaccess Corp. is located at 1076 East Meadow Circle here.



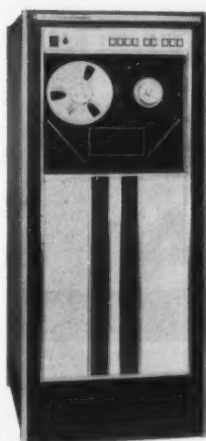
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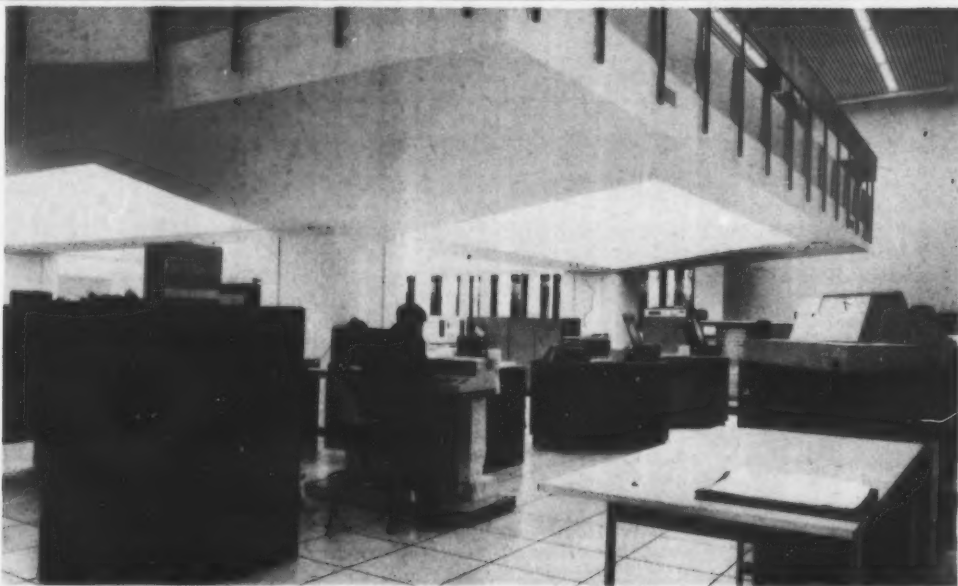


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Systems Dimension Limited's "Systemcentre" currently houses a 360/65. Next month, the 65 will be replaced by a 360/85, the company says.

## Repeatable Charges for OS/MVT Users Possible

OTTAWA, Canada — An OS accounting package for the S/360 that offers repeatable charges for identical jobs and is said to require less than 2% increase in overall run times has been developed by Systems Dimensions Limited.

Accountpak is implemented, the company says, as an overlay program and requires between 16K and 32K of memory. The size is dependent on various possible options, the company says.

The package is really far more than a simple accounting package, since it actually takes control of the job dispatching functions of OS and routes job requirements through devices that increase the overall job through-

put of the system, the company says. Output reports are written over the System Log, or scheduled to a spare sequential output device.

### Pricing Algorithm

Pricing is done based on an accurate measure of total system performance, in combination with detailed measurements of actual device times, CPU time, and channel requirements for each specific job. This will, the company says, greatly improve the total number of jobs run through a large system in any given time period. The basic information regarding start/stop time for tapes, channel write times for data transfer, and nominal times required for system housekeeping are built into the algorithm. This is intended to make job charges more realistic, and much more accurate, the company says.

The package is available from the company's offices here at 770 Brookfield Road. It was developed under a research contract with the University of Ottawa computing center.

CALCTRAN makes your IBM S/360 remote terminal a more advanced programmable calculator than you can buy at any price. In fact, it is almost as advanced from ordinary desk calculators as they are from finger counting. In addition to providing cost-effective electronic desk calculator-type service with the bonus of hard copy output (from typewriter-type terminals), CALCTRAN provides the growth potential of all the other terminal services of the S/360 via this easy introduction. Put all your terminals to work for you, for just a small investment, with CALCTRAN.

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## Skills Profile Systematizes Personnel Data

NEW CITY, N.Y. — A system has been developed to assist companies in manpower planning, promotion, and use of available talent.

Called the Skills Profiling System, (SPS), it consists of a programmed profile that lists the skills, experience, potential, and the preference record of a firm's employees.

The system can be used by small companies having only several hundred employees as well as larger corporations, according to William E. Berry, vice-president of Information Science Inc.

SPS, which runs on an IBM 360/30 and requires at least a 64K memory, surveys a company's employees, provides the names of those who might have the proper background for an opening, and generates a report on each person qualified for the position.

Using the reports as guides, personnel departments can select persons best fitted to each opening.

Feasibility studies, cost analysis, and implementation are carried out and tailored for the firm exploring the possibility of using the SPS. The system can be connected to existing payroll or personnel data systems.

Installation takes three months and is included in the price of \$23,000. Consulting and documentation are also included in the price, according to Berry.

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# Software Observations: Users Unaware of Software Capitalization Impact

By Peter L. Briggs  
CW Software Editor

Have we just heard the death knell for purchased software?

The recent IRS ruling regarding capitalization versus expensing of software might make one think so, but the users, as a whole, don't seem too aware of the problem.

The suppliers seem to feel, as evidenced by Dick Jones, ADR president, that "The rulings don't make much difference. We don't sell Autoflow anyway, but if we did, the write-off would probably be the same as the lease price, per month."

The specific ruling involved is entitled "Costs of Purchased Software." It states that purchased software that is not part of an original purchase or rental price of a computer system must be considered as a capital expense. As such, it must be amortized over a five-year period, unless it can be clearly shown that the life-span is less than five years.

## Not Involved

"Most of the financially oriented types in a company are too divorced from the trends in the computer industry to really notice the difference," says Edward Cullinane, Cullinane Corp. president.

"In addition, the DP types are not generally aware of the implications of these things on the company's profit and loss statement," he continued.

## Package Provides Accounting Firms With DP Service

NEW YORK — Small accounting firms will be able to computerize their services for less than \$20,000, including data processing equipment, through a new concept being offered by The Computer Exchange, Inc.

The Accountants Data Service can be used by three-man accounting firms as well as larger companies.

The service provides all the capability necessary for the accountant to provide customers with balance sheets, profit and loss statements, and other required documents, according to Harvey N. Berlent, president of CEI.

The ADS package includes IBM equipment (a 402 or 403 accounting machine, a sorter, a keypunch, and a summary punch unit), programs, supplies, instruction, and education needed to handle all of the basic write-up functions. The service can be put into operation within 30 days.

The ADS system is tailored for the individual accounting firm, and the price ranges from \$12,000 to \$20,000.

Computer Exchange Inc. of New York is located at 30 E. 42nd Street.

Most of the early suppliers have concentrated on one-time leases or sales, rather than monthly leasing or rentals. This has been due, in the main, to the need for immediate cash to support the companies.

Now that the software market is being conditioned, by IBM, to accept rental software, and now that the software companies have more of a product base, the companies would prefer to rent.

The income base extends over a longer period and improves return-on-investment for these companies.

## \$1.45 Billion

Estimates describing the additional revenues obtainable for

the IRS under this new ruling have run as high as \$1.45 billion, yet these figures have not bothered the users noticeably.

In discussing the problem with the vice-president of data processing for a large bank, he said, "We know about the ruling, but it just doesn't make much difference to us. If we can lease, we will, but we generally have to buy the larger packages anyway."

## Most Users Unaware

Most users contacted were almost completely unaware of the ruling or its potential impact on their company's profits. Those that had heard of the ruling did not, in general, understand why

it should matter whether they expensed or capitalized software.

As one software industry spokesman pointed out, "The final burden of these additional taxes must rest with our customers. The billions of dollars they may have to fork over to cover these taxes certainly should interest them!"

Companies like IBM, it is said, have expensed all software development, as a matter of course. Under the new rulings, if a developer can show that this has been policy for some time, then it can still be continued.

Most companies, however, don't have that backlog of years of reporting such items as ex-

penses, and therefore must accept the basic rules for capitalization.

What package that exists today, and is still in common use, was written over four years ago? Even three years? Very few! This places the burden of proof, in each individual case, on the company involved to prove that this product must be amortized over less than five years, an expensive and time-consuming process. It just isn't worth the effort, for most companies.

Thus, the government may obtain even more revenue than planned as a result of its choice of a five-year, rather than a three-year, capitalization period.

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## Package Design Simplifies Generation Of Complete Debugged Cobol Programs

EAST ORANGE, N.J. — A computer software product directed toward reducing turnaround time for writing and testing programs — Miracl/CPG (Cobol Program Generator) — has been developed by Republic Software Products Inc.

Miracl/CPG generates complete, debugged Cobol programs with far less effort than the normal use of Cobol, according to the company.

The Miracl system, developed and tested over two years, is said by the company to replace as many as 30 or more Cobol statements, allowing programmers to spend a higher proportion of their time on program and sys-

tems logic instead of clerical details.

An additional feature makes it possible for non-programmers using Miracl to generate reports, according to the company.

Basic features of the product include: the ability to utilize ten I/O files, full compatibility with Cobol, the opportunity for a programmer to add Cobol coding if desired, and the ability to operate as a "load and go" system whereby a completely bug-free Cobol object program is generated for execution.

Miracl includes a file description library and dictionary (data files can be defined once and used repeatedly), program request booklet, and a system doc-

umentation feature that provides complete program documentation automatically, said the company.

Rights to use Miracl/CPG may be obtained through a licensing arrangement with Republic Software Products Inc., 715 Park Ave.

## Multiple Access Available to T/S Files, Data Base

UNION, N.J. — A file sharing capability provides users of Virtual Computer Services' time-sharing service with access to the same file, program library or data base.

The file sharing technique may be useful to customers ranging from banking institutions to private operators who have terminals in their homes, according to a company spokesman.

A conversational English command sequence makes the common file available on a read-only basis. Protection is provided in that passwords are only known by authorized persons.

The time-sharing service uses an IBM 360/67 that operates with 256K of on-line storage.

Headquarters are located at 1119 Springfield Road here.

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## How to survive in Las Vegas during the Fall Joint Computer Conference.

**1.** Give the right instructions to your secretary before you leave. When the FJCC is in Boston, it's fine to have her tell callers, "Mr. Jones is in Boston this week." But Vegas is a whole different bag. One fellow whose secretary simply told callers he was in Vegas during the FJCC five years ago returned to find (a) the outside accounting firm performing a special audit of his department, (b) his mother-in-law had flown in from Poughkeepsie to be with her daughter during this trying period, and (c) he had been impeached from his position as chairman of the company baseball pool. So it may be wise to have your secretary emphasize the conference along with the location.

**2.** When you tell your wife over the breakfast table that you're going to the FJCC and she says, "Where's it being held?", try answering the question with your mouth filled with toast. This will be messy. But telling her audibly could be much messier.

**3.** Warning: the "Las Vegas is a bore" routine was tried five years ago by 873 executives who did not want to bring their wives. 872 of them arrived at the FJCC with their wives. The other one was spared when his spouse fell off the wedgies that she had bought especially for the trip and sprained her right ankle.

**4.** Keep in mind that the addition of several thousand conferees in Las Vegas creates reservation problems in restaurants and night clubs. This can be solved by

(a) planning ahead, (b) tipping lavishly, or (c) changing your name to Howard Hughes.

**5.** Single men should be aware of the fact that Nevada's laws make it easy to get married there. If your resistance to nuptials decreases under the influence of alcohol it is wise to watch your input. At the last FJCC in Las Vegas one executive failed to heed this warning. He is now defending law suits from two cocktail waitresses, one female blackjack dealer and a reader-plotter with COM attachment.

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**6.** If you're reading this ad at the FJCC, some of the foregoing is already too late for you. Sorry we didn't catch you earlier. But all is not lost. You're still in time to get a special survival aid from Edutronics Systems International, Inc., at FJCC exhibit booths 8403 and 8404.

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## System Users Should Anticipate Possible Conversion Problems

(Continued from Page 21)

Perhaps the "free-form" language is not the real solution to our problems. Can a user really say his workload has been lessened, his programmers' output improved, or his costs lessened through the use of Cobol? Certainly Cobol is a vast improvement over its predecessor — assembler languages. But Cobol does not offer that flexibility needed to keep reasonable pace with a rapidly changing technology.

Recently the trend has been toward the use of "forms-oriented" languages (languages that are predefined in format and specifications). These languages enable the programmer to take advantage of prewritten routines to handle ordinary record processing, decision-table logic, report formatting, and other routine tasks.

### Two Candidates

Two of these languages are Adpac, a product of the Adpac Computing Language Corp., and Mark IV, a product of Informatics, Inc.

Both languages offer the ability to make use of prewritten processing routines and to specify reports simply. This can reduce the overall programming time by an order of magnitude, when used properly, thus reducing costs and improving output.

Adpac goes even further, providing a language capability beyond that needed for ordinary file management and report generation.

All the bells and whistles are present, for those who need them, but they are not necessary in the normal type of programming going on today.

This type of language offers several advantages to the user:

- It forces the user to standardize the repetitive aspects of data processing, achieving the goal of reproducibility.
- It eliminates great amounts of programmer training time.
- It markedly increases the actual output, in terms of debugged programs, from every programmer using the language.
- It offers an inter-machine compatibility not available from any computer manufacturer.

### Why Compatibility?

It is certainly not in the manufacturer's best interests to offer the user complete compatibility — the user would then get rid of all his current equipment and order the newest gadgetry, reducing the income to the manufacturer. Some degree of compatibility is generally provided.

Use of it, however, is intentionally made somewhat difficult to slow down and control the turnover rate.

The independent software supplier, on the other hand, can offer the user a compiler for the latest machine and guar-

antee that every existing program will run on it.

New features are simple to insert into these fixed-format languages. They can be added without changing existing features. This modification ability allows the user to take complete advantage of all the new hardware capabilities, within the limits of his system design, and invest nothing in conversion except the cost of the new compiler.

Computer manufacturers are in business to make the largest profit possible. This is a most laudable goal when combined with the integrity and business acumen needed to compete in any growing industry. This also leads the potential user to expect better treatment from his manufacturer — in the areas of hardware.

Software, however, becomes a different situation. The competition is stronger because of the proliferation of software companies.

The level of integrity is lower, because of the minimal amounts of money and skill needed to get into the business. It does not require much to convince three friends that you "can make a million in a year" with a \$5,000 investment.

Those companies that have existed for a few years, and have proven their reputations with a large list of satisfied customers, can be relied upon to behave as if they were in business to stay.

Many services are currently available that provide a comparison of software products. One example is the book *Software Packages: an Encyclopedic Guide* from System Interaction Corp. It includes customer analysis as part of its reports.

The use of independent software does offer a valid, cost-effective, manpower-effective saving for the user who plans to perform ordinary data processing, such as that required for general ledger, accounts receivable, etc.

For the user who needs to develop his own programs and packages, the newer languages seem to offer the best solution simply through the availability of better programming techniques and broader machine range.

More important, however, is the potential savings in avoiding conversion problems. Let the software house provide the effort to ensure software compatibility, not the user. Let the software companies, in the best interests of good profits and long-term reputations, make certain that their software is available for new machines as soon as the machines are available.

The use of independent software and proprietary languages could almost completely eliminate conversion problems, from a technical standpoint, and ensure the continuing operation and success of the user's investment in data processing.

## Service Converts Basic To Fortran on IBM 360

By a CW Staff Writer

NEW YORK — A means of converting programs from Basic, the language developed by Dr. John Kemeny at Dartmouth College, to Fortran has been developed by International Conversion Systems, Inc., a subsidiary of Phillip Stewart Turner Associates Inc. Oriented around the S/360 Operating System (OS), the conversion technique is also being offered as a service by the developer.

Current requirements for the translator include a S/360, with 128K of memory, operating under OS.

The translator can, at the user's option, convert either Basic or Extended Basic

into Fortran G, H, or Watfor.

The intent of the translator, according to the company, is to provide access to in-house computing facilities for managerial personnel.

Basic has long been recognized as a language well-suited to financial and managerial functions, eliminating much of the need for training or special assistance when such programming is to be done.

In addition, the translator would make time-sharing-based programs available for in-house execution.

Both the package and the service are being offered from the company's headquarters here at 370 Lexington Ave.

## Cobol-Coded Receivables System Runs on a Number of Machines

COLLEGE PARK, Md. — An accounts-receivable system designed for both private users and service bureaus can process both on an open-item basis and a balance-forward basis.

Delta Data System's accounts-receivable system consists of 22 programs and sorts. It is written in Cobol. The system uses 32K and runs on the 360 Series, either in tape or disk configuration, and is adaptable to Honeywell's 200 Series and Burroughs 3200 system.

Features include multicompany processing; automatic calculation of trade discounts, net amounts, and service charges; automatic aging of accounts receivable; preparation of COD invoices and monthly statements; automatic flagging of "stop shipment" status; ability to apply payment to current 30-, 60-, or 90-day balances on balance-forward accounts; automatic flagging for unmatched payments for open-item accounts; and auto-

matic handling of unapplied payments for open-item accounts, according to the firm.

Reports produced by the system include validation reports for both product file and account master file update data; product file maintenance report; product file code book; invoices; statements; inactive account report; and delinquent account report.

Prices for the system are \$10,000 for private users and \$15,000 for service bureaus. The system can be leased for \$400/month for private users and \$600/month for service bureaus, with an implementation fee of \$2,500 for a three-year lease. Full documentation is provided, reports the company.

The system can be in operation two weeks after the contract is signed, a spokesman said.

The firm is located at 9903 Rhode Island Ave.

## OS/360 Job Control Statements Generated Faster By JCL 360

WASHINGTON, D.C. — A software package called the JCL/360 control statement generator has been designed to reduce computer reruns due to JCL (job control language) errors.

Computer Audit Corp., the developer, says the package generates job-control statements for use with IBM OS/360 and will operate on any IBM 360/40 or larger. JCL/360 requires approximately 70K and will operate with all OS operating systems.

Turnaround time for completion of testing and production runs will be decreased since the language produced by the JCL/360 system will be accurate and complete, claims the company.

JCL/360 lists the basic input parameters, provides a listing of the generated control statements, and produces a

punched deck of the generated control cards which can be used immediately for subsequent processing or can be held for processing at a later date.

The generated control statements are alphabetically sequenced and identified with the job name to be processed. An optional feature allows the generation of a complete job system, ready to execute.

The JCL/360 system is estimated to generate about 450 control statements per minute, according to Robert Haga, technical director.

The package can be leased for \$240/month or can be purchased for \$4,950. Installation includes user's manuals, worksheets, and training of programmers and system analysts, the company says.

Computer Audit Corp. is located at 1150 Connecticut Ave.

## T/S Service Offers Digital Logic Analysis

NEWTON, Mass. — A digital logic analysis program, Digilog-1, that provides a capability for modeling and performing analysis of large digital logic circuits, is now available.

Dial Data Inc. offers the Digilog-1 program free of charge to time-sharing customers.

Digilog-1 gives the logic designer a valuable testing tool eliminating the necessity for much time-consuming laboratory testing of logic normally performed, the company claims.

The language of Digilog-1 was developed especially for the logic designer. The time-shared interface allows quick entry, test, and modification of logic designs until the correct response is achieved. The circuit may then be saved for later use, according to the company.

With the program, the user can select from 16 different building blocks. Also provided are blocks with which control output to the teletypewriter can be generated in hexadecimal, octal, or binary form and triggered by any change of state chosen by the user, the company claims.

Digilog-1 can accommodate circuits with up to 500 building blocks, according to the company. The program uses 30K of core and runs on a Xerox Data Systems 940 system.

Digilog-1 is the first in a group of electronic design packages offered by Dial Data to assist engineers in a-c, d-c, and transient analyses of circuits; simulation of analog processes; microwave systems design; and filter synthesis.

Dial Data Inc. is located at 1001 Water-town St.

## Marv Ehlers says, "Processing logjams can be broken with Brandon RMS!"

But that's only one of 12 major user benefits.

RMS is the new software package developed by Brandon Applied Systems. It plans, schedules, and controls equipment and personnel resources in EDP installations.

We'd like to tell you about the 11 other advantages of RMS at our regional Technical Briefings. Plan to attend. Simply call Ellen Kerker at (212) 757-2100 for reservations, or if you can't attend, request RMS information.

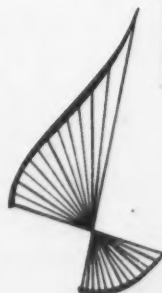
### Schedule of Technical Briefings

MINNEAPOLIS December 4  
MILWAUKEE December 2  
TORONTO November 20  
MONTREAL November 25  
CINCINNATI December 9  
PITTSBURGH December 11

BRANDON APPLIED SYSTEMS, INC.  
1700 Broadway, New York, N.Y. 10019



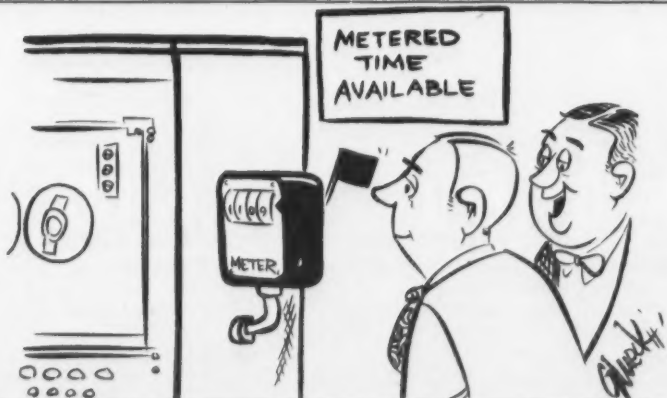
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## Software at the Fall Joint

### Measurement System for Spectra 70

SAN FRANCISCO — A new version of the Boole & Babbage System Measurement System, one for the RCA Spectra 70 Series, is to be announced at the FJCC, according to a company spokesman.

SMS, a large system consisting of several packages including Cue, a configuration utilization analyzer, and PPE, a problem program efficiency analyzer, has been running for the S/360 computer for several months.

Included in the company's exhibit will be many of the results obtained with SMS and the types of improvements possible using the system.

In addition to MPS, the company is announcing its new MP-65 operating system for the 360/65. The system is oriented towards on-line applications and is said to be a significant improvement over IBM's OS for many uses.

### Certifiers

PHOENIX — Three products for certification of disk packs, two of them new announcements, are being shown at the Peripherals, Inc. FJCC booth this year.

They are Pack Scan I, Pack Scan II, and the PI single disk burnisher. Pack Scan II and the PI-burnisher are the new products to be shown publicly for the first time.

PI claims to be the first manufacturer to offer a 2316-type disk pack certifier — its Pack Scan II. Use of this unit, with all of its own logic, storage, and control functions, makes the use of a central processor unnecessary.

A new feature of Pack Scan I and II is the optical fringe transducer and harmonic drive which provides for a plus-or-minus 100 micro-inches accuracy. This, coupled with single spindle configuration, eliminates the need for dual drive and provides precision testing of 1 mil to each side of the center line of every cylinder, according to the firm.

In the evaluation of compatible disk packs, a strip printer is utilized. This plugable unit on the control panel is a self-contained modular assembly used to provide a hard-copy printout of all error information. Acceptable threshold levels are adjustable for all four analog tests, permitting the user to establish rejection criteria.

The PI-burnisher was designed and produced at the request of a major producer of disk packs to provide an effective yet inexpensive instrument to burnish disks, thereby establishing surface uniformity and reliability. It is designed primarily for use by disk and pack manufacturers to enable them to deliver near perfect disks to their customers.

The new products can be seen at booth 11008.

Information regarding these systems will be displayed in booth 1501 at the International Hotel.

### Data-Base T/S

MINNEAPOLIS — A conversational system for data base manipulation is scheduled to be announced by International Time-Sharing Corp. at the FJCC.

Dubbed Q-Pak, the product is said to offer a high degree of flexibility to users in such applications as survey and questionnaire analysis, market and sales analysis, as well as a number of generalized information retrieval uses.

Q-Pak will allow complete cross tabulation of data with data identification by either al-

phabetic or numeric labels, reports Robert L. Howell, company product manager.

Q-Pak is said to combine the functions of tabulation and statistical analysis into one package. The result is a more efficient way of handling large data files in a meaningful and rapid manner, according to the developer. This is made possible by the large storage capacity and the fully randomized file handling capability of the ITS computer system, the company says.

ITS will be demonstrating Q-Pak as well as other specialized time-sharing applications, such as Ecap, Apt, and Foresight.

The firm intends to demon-

strate on a variety of terminals which include Teletype, Selectric, plotting, and CRT, in booths 5003-5004.

### Codon-ARDS Software

WALTHAM, Mass. — Grafix, a system capable of driving the Computer Displays, Inc. advanced remote display station, (ARDS), has been developed and is being announced at the FJCC by Codon Computer Utilities, Inc. The system is designed for Codon's PDP-10 system.

Grafix enables Fortran IV programmers to develop application programs with graphical input and output. Fortran-callable Grafix routines perform many basic graphical operations and enable the user to create, modi-

fy, and display complex graphical objects.

Examples of applications for which Grafix is appropriate include: a circuit design program for electrical engineering, a structural analysis package for civil engineering design, an information retrieval package as part of a management information system, or a computer-aided instruction program.

Grafix also allows time-sharing users to use the ARDS as a high-speed silent typewriter-like terminal for nongraphical applications.

Computer displays will demonstrate the Grafix system at the conference using Codon's time-sharing system.



## the computer industry's first key-to-disc data input system

**accepts the output from 60 or more  
key stations simultaneously**

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### Time-shared input cuts data preparation costs 50%.

Now you can cut your computer input costs in half. This new innovation in data preparation techniques gives you two money-saving advantages over conventional keypunch or one-key-board/one-magnetic-tape-per-operator systems: (1) the LC-720 employs a computer time-shared input; (2) it is the only system available that provides data output directly on IBM/360-compatible magnetic disc.

By time-sharing the data from 60 or more keyboard operators simultaneously, significant savings in data station costs of as much as 50% can be achieved. Costs drop to as low as \$4300 per data station for a typical 60 station system. For large data preparation installations, the time-shared input is the only economical way to go.

Data entered into the LC-720 is processed by a small digital computer and stored on an IBM/

360-compatible magnetic disc that provides the advantages of bulk storage and high speed random access of data. The problems associated with punched card handling or the mounting, pooling, merging and unmounting of magnetic tape reels are eliminated. All data is conveniently and economically stored in an IBM 1316 disc pack for direct high speed input to your modern data processing system. Naturally, an IBM/360-compatible magnetic tape is also provided with the system as standard equipment.

The LC-720 KeyDisc System also offers for the first time, data verification requiring one input pass only through the system, in addition to the normal technique of verification requiring two different operators. Record size is infinitely variable by each operator from 1 to 120 characters long and the system stores a large library of 30 or more different format control programs, all available simultaneously to any and all operators.

### LC-720 KeyDisc System

#### Bring your own data for a demonstration

Logic Corporation invites you to see an operating demonstration of the LC-720 KeyDisc System at the company's premises. Bring your own original data and Logic will provide a reel of magnetic tape of the output of your data from the LC-720 for later printout at your own computer facility.

To arrange for a demonstration, contact Gary Tischler, Director of Marketing (201) 334-3713

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## Software at the Fall Joint

### Reports Automatically Formatted, Typeset on Film

SAN DIEGO, Calif. — High-volume data, such as parts lists, directories, maintenance manuals, and management reports, all usually stored and updated in a computer, can now be automatically page formatted and typeset using the new DatagraphiX Autotype System, according to the firm.

Developed by Stromberg DatagraphiX, Inc., a San Diego-based subsidiary of General Dynamics, the Autotype System consists of a software program that operates entirely on the company's standard 4060.

The preparation of the source

data to be typeset is independent of the Autotype system; the data may be generated on a computer, keyboard-to-magnetic-tape terminal, keypunch, or paper-tape perforator, the firm says.

According to the company, no special computer programming is required, as the system accepts text in any character code and any format (up to 4,096 bytes per block) that has been stored on 7- or 9-track magnetic tape.

The system produces composed and typeset pages on 16 or 35mm microfilm, including page and columnar headings, col-

umn rules, page numbers, and repetitive text such as company name or logo. The 35mm microfilm can be used for on-line proof copy or off-line printing, whereas the 16mm microfilm is normally used with the 1700 inquiry station or the 3500 production hardcopy printer.

Offering a selection of one of four Character font sizes together with serif or sans-serif typeface from the font file, the system permits operator flexibility in choosing page composition and throughput speed and typeset quality.

The system is controlled by

ACL (Autotype Command Language), a group of 78 basic commands that have been stored on paper tape and entered through the 4060's product control unit. Each command describes one characteristic of either the text on the input magnetic tape or the output page.

The system can be seen at booth 8300.

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## It's made time-sharing a graphic art.

The new time-share terminal. Hewlett-Packard's answer to the graphic time lag. HP's graphic terminal picks up where the Teletypewriter leaves off and provides a revolutionary new capability: in-house graphic plotting of all time-share computer data. Instantly. Accepts time-share EIA ASCII inputs from the Teletypewriter.

The HP 7200 Graphic Plotter generates visual presentations of mathematical and engineering functions, no matter how sophisticated. Or it plots business computations like bar graphs and pie charts. It can spot a trend, prove a theory, compare data, generate engineering designs. It lets the time-share user get more use out of a

terminal because he can get more use out of the numbers. He instantly comprehends typewritten data in smooth, clear plotted form.

HP's versatile new Terminal for time-share systems plots points or lines. Each data point is defined by its X-Y coordinates and the 7200 is a vector plotter, plotting absolute coordinates from all inputs. The position of the plot is adjustable and any preprinted grid or blank paper can be used. No special training is required to operate the 7200.

Check out Hewlett-Packard's new

7200 Graphic Plotter. It's available through time-share services. Call and learn how simple it is to plot computer-resolved problems — points, curves, circles, lines, ellipses, contours, bar or pie-charts. You name it. Look into expanding your time-share capability. Any time-share service that hasn't heard about the 7200 should talk to us.

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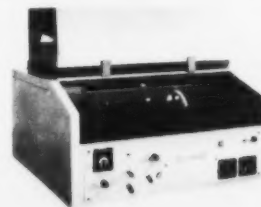
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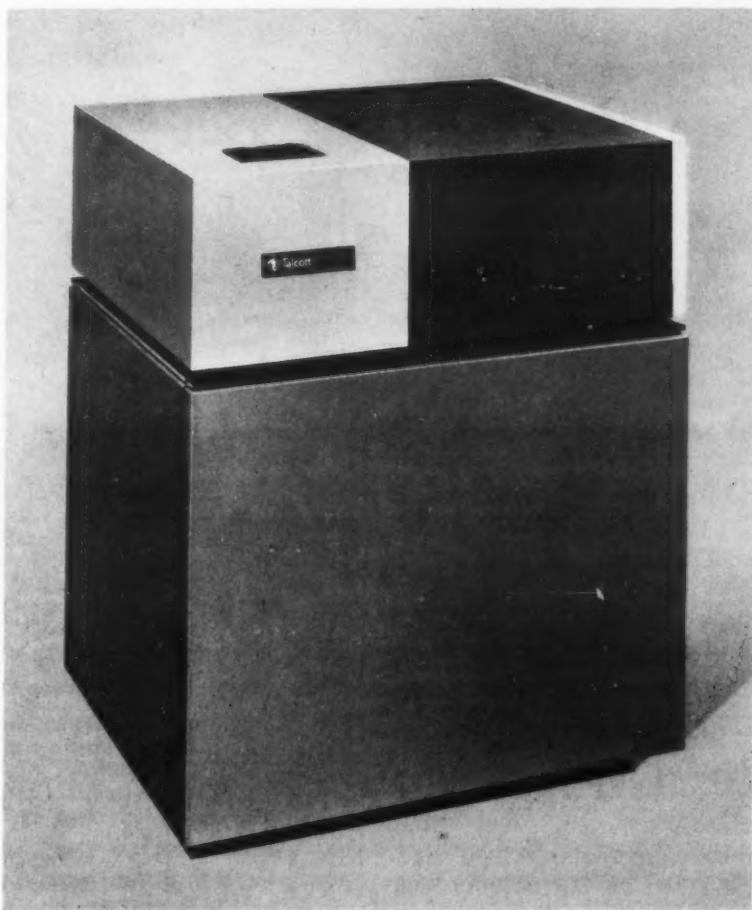
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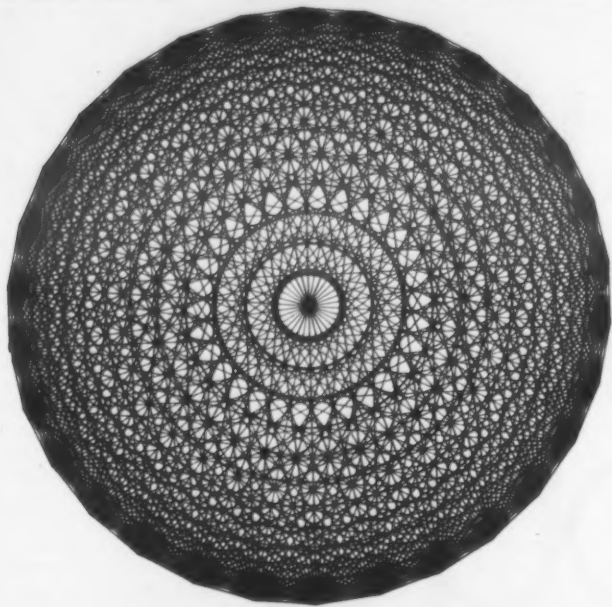


## Talcott

**TALCOTT COMPUTER LEASING**

Division of James Talcott, Inc.

1290 Avenue of the Americas, New York, N. Y. 10019



Design produced by Milgo plotting system.

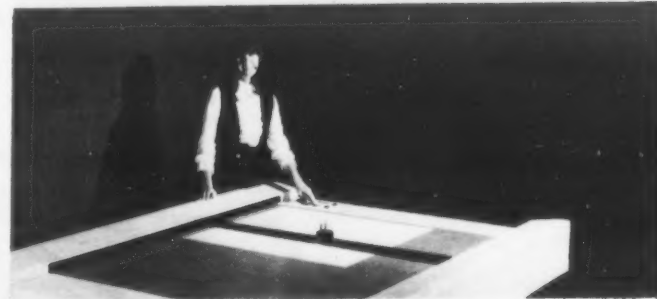
## Data Plotters

### Milgo System for Engineering Drawing

MIAMI — A general-purpose X-Y plotter, the DPS-7, will be the entry from Milgo Electronic Corp. at this year's FJCC.

Priced from \$26,000 to \$32,000, the DPS-7 is available in either 30 in. by 30 in. or 45 in. by 60 in. flat-bed surfaces and includes full software support, the company says.

The unit is intended to provide economical and practical uses in engineering drawings, pipeline design, contour mapping, machine tool verification, highway and waterway layouts, financial data, and data reduction, the firm says. The plotter uses hybrid



Milgo's new DPS-7 plotter

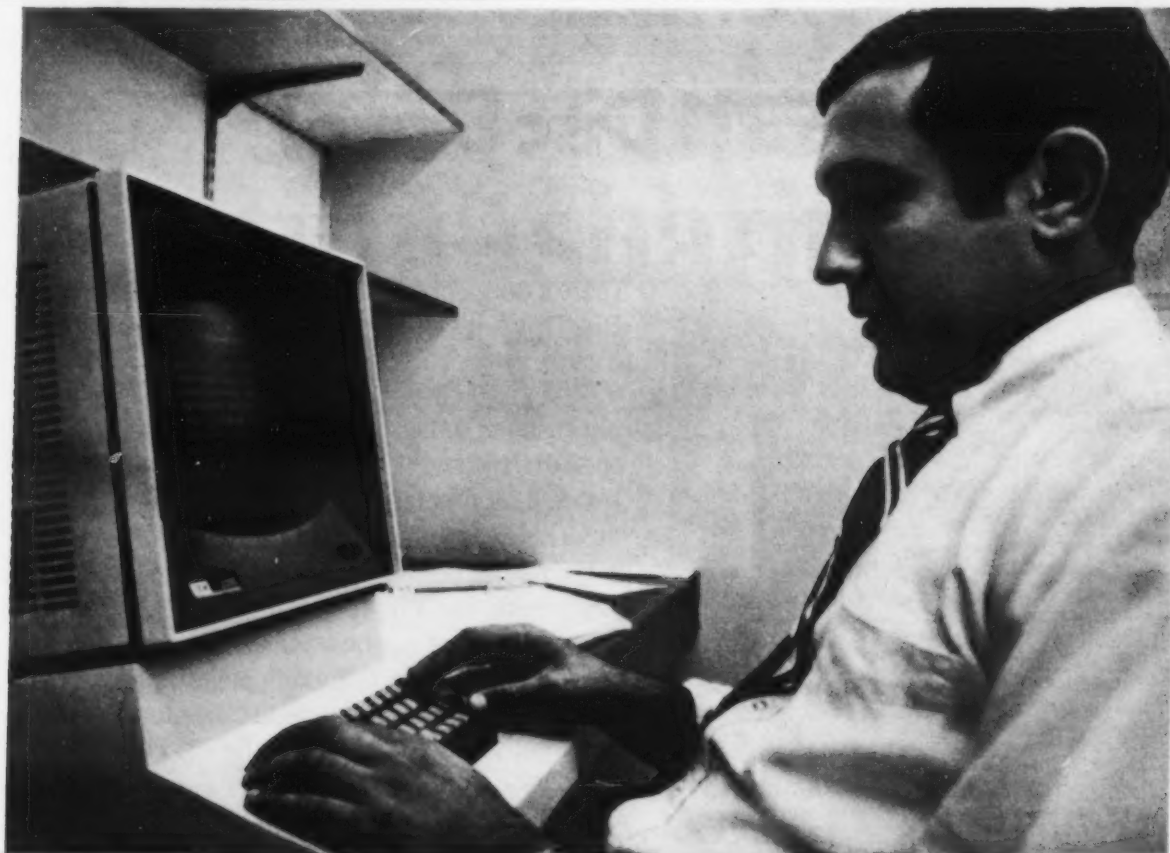
circuitry to increase the speed and resolution of the resulting drawings.

Software support includes a

basic software package, incorporating all plotter functions, and specialized application packages, written in Fortran, from the company's applications and programming group, according to the firm.

The paper is held to the surface by a vacuum system. An optional higher-speed plotting mode is available which is capable, the company says, of plotting at 12 in./sec. for an additional \$3,600. Lease prices are available on request.

The units will be on display at the company's booth 7700.



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### 430 Plots 20 In./Sec

WEST LONG BRANCH, N.J. — The 430 dataplotter will be the center of the Electronic Associates, Inc. display at the show. Two new versions will be shown.

The Model 430/100, with a 31 in. by 36 in. table, and 48-character symbol printer, a four-pen color drawing assembly, automatic velocity control, and positive positioning, plots at up to 20 in./sec with 0.001-in. resolution.

The Model 430/300 flat-bed plotter has an 11 in. by 18 in. bed, designed for drawing circuit masks and precision graphics. It uses an optical wiring system with 50 selectable apertures.

Accuracy is to 0.001 in. with a repeatability of 0.00005 in.

Prices range from \$55,000, the company says. The plotters will be on display at booth 8000.

#### Auto-Trol 6030

ARVADA, Colo. — A new entry from Auto-Trol Corp. that is capable of drawing in 0.0005 in. increments at speeds up to 10 in./sec will be introduced at the FJCC.

The Model 6030 digital coordinate plotter can be used either off-line or on-line, and inputs from punched cards, paper tape, or magnetic tape.

Available features include a flat-bed plotter with table sizes 40 in. by 40 in., 40 in. by 60 in., and 60 in. by 60 in. A Nixie-type display indicates each coordinate as it is entered. Three formats are available: Fortran, machine tool, and standard.

Overall accuracy is claimed to be  $\pm 0.006$  in. with a  $\pm 0.001$ -in. repeatability. Options available include drum-style plotting surface, full alpha printing, vacuum hold-down, and buffered input.

The price ranges from \$30,000 to \$50,000, and the unit will be displayed in FJCC booths 3007-9.



IBM 2311 Model 1 Disk Drive

# \$24,745

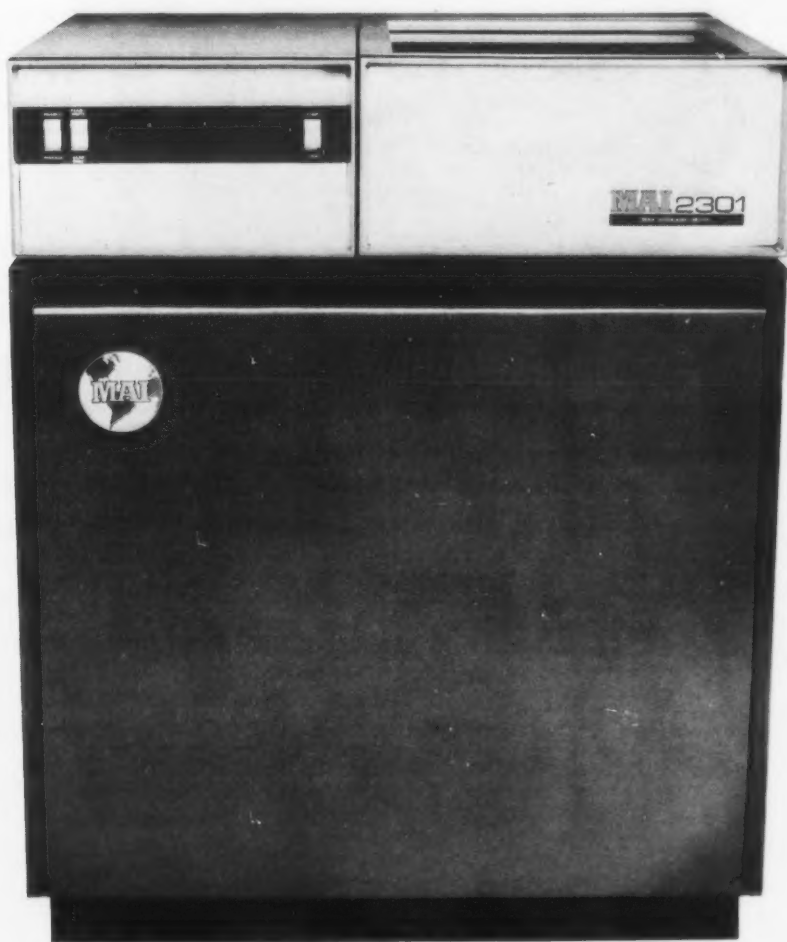
If you choose the machine on the right you can get 33% faster average access time, less maintenance, faster start and stop time, and greater operating convenience. That other machine begins to look pretty expensive.

The MAI disk drive is faster because it converts electrical energy into linear motion. Electrical energy can be manipulated faster than hydraulic energy, giving you quicker access to stored information.

Lacking gears, hydraulics, printed circuit motors, fluid connections, and other complicated mechanical systems, the MAI disk drive has fewer parts. Which makes the load-unload concept simpler. It requires no torsion bars or fluid pressure because the loading force is supplied by a simple spring.

A new air circulation system equalizes the disk drive and disk pack operating temperature, which in turn reduces start time as much as 25%.

The 2301 unit is braked electrodynamically. It takes 10



MAI 2301 Model I Disk Drive

# \$18,300

seconds to stop at most. The IBM coasts to a stop in 20 to 60 seconds.

Whether you're buying or renting, it doesn't make much sense to pay more for a lesser machine.

- ☐ I would like more information about the MAI 2301 Model I Disk Drive.  
☐ I would like a salesman to call me for an appointment.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

**MAI**

300 East 44th Street, New York, New York 10017  
 Offices in principal cities of the United States and Canada.  
 Also offices in Mexico, Europe, South and Central America.

**For a demonstration, come to booth #110-111 at the Fall Joint Computer Conference.**

## Terminals on Display at the Fall Joint



Twindek multi-purpose terminal.

### Magnetic Tape Deck Improves Teletype Transmission Speed

HOUSTON — The use of a magnetic tape deck, recorded incrementally, to improve the transmission speed of standard ASR and KSR-33 teletypewriter units will be demonstrated by Universal Data Acquisition Co., Inc. at the FJCC at Sahara booth 12001.

The unit, designated Twindek 5800, provides batch I/O at a transmission speed of 110 char/sec, the company says. Twin decks, one read and one write,

are used for data transmitted over voice-grade lines via a 202C modem. Each cartridge will store up to 200,000 characters.

The company, located at 6400 Westpark, Suite 235, Houston, says that the terminal has an unattended remote polling capability, allowing the central computer to access a day's accumulation of remote data at night, or during other periods of less than peak traffic.

Conversational on-line opera-

tion is retained by bypassing the tape deck. In this mode, speed is 10 char/sec.

The write deck is created from the keyboard, then transferred to the read side for transmission to the computer. Data generated by the computer is recorded on the terminal and then can be listed on the Teletype.

Twindek sells for \$2,450. The price, including a KSR-33, is listed at \$3,230. Lease terms are available.

## We have a selling idea!

For the first time in the computer industry, a marketing organization has been created to serve the entire industry. Marketing is our only business! You concentrate on designing, debugging, engineering, producing, documenting, and delivering a quality product. We'll sell it!

Vendere International Marketing Corp. concentrates only on marketing by providing:

- Professional Sales Representation
- Knowledgeable Product Evaluation
- Coast-to-Coast Coverage
- Experienced Marketing Management

Your talent does what it knows best. We do what we know best—for you.

Vendere International Marketing Corp. will be at the Fall Joint Computer Conference to talk to computer manufacturers and suppliers seeking maximum markets. We want to talk to a few quality companies who are seeking professional marketing representation.

Meet our Corporate staff: Ham Hawkins, Tom Gilroy, Gordon Utt, Bob Wigger, and Jerry Hummel in Las Vegas, November 18-20, 1969, Suite 1523, Caesar's Palace. Or write to N. H. Hawkins, President—Vendere International Marketing Corp., Wells Fargo Bank Building, Suite 225, Del Amo Financial Center, Torrance, California 90503.

**a professional  
marketing service for the  
computer industry**

# VENDERE

MEET US AT THE FJCC, CAESAR'S PALACE, SUITE 1523

### Terminal Can Be Computer

PHOENIX — Motorola will demonstrate a new group of specialized communications terminals at booths 305-308.

One terminal features message concentration, communications capabilities, and a mini-processor. The latter gives the unit the ability to function as a stand-alone computer in the preparation of sales forecasts, market analyses, payrolls, collection and billing data, etc.

A typical system contains, in addition to the basic MDP-1000 mini, a Motorola data recorder (key-to-tape or for transcription from an optical mark reader), and an electrostatic printer that can operate at speeds up to 4,000 word/min.

The optical mark reader translates punched or pencil-marked



input into ASCII (or other binary) code for output to telephone data sets and acoustic couplers. The company says that "software and a variety of peripheral options lend to versatility."

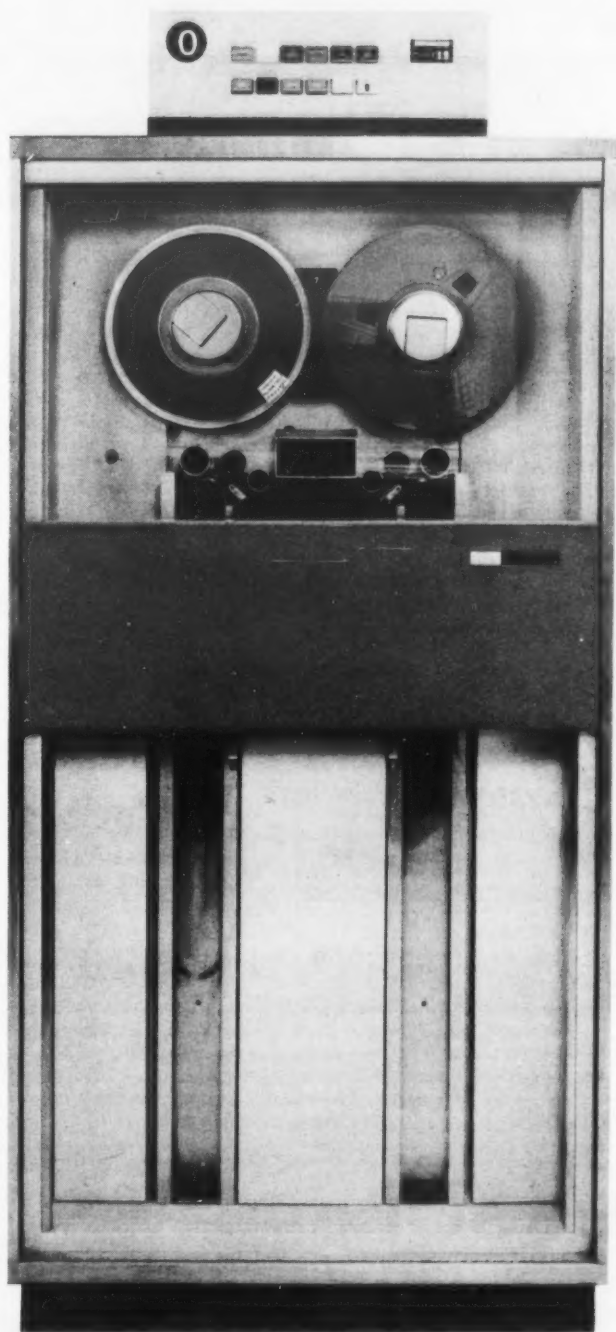
### Hard Copy Terminal

MINNEAPOLIS, Minn. — A hard copy terminal for under \$30,000, including card reader, line printer, and asynchronous modem, with options including CRTs, will be displayed by Computer Terminals, Inc.

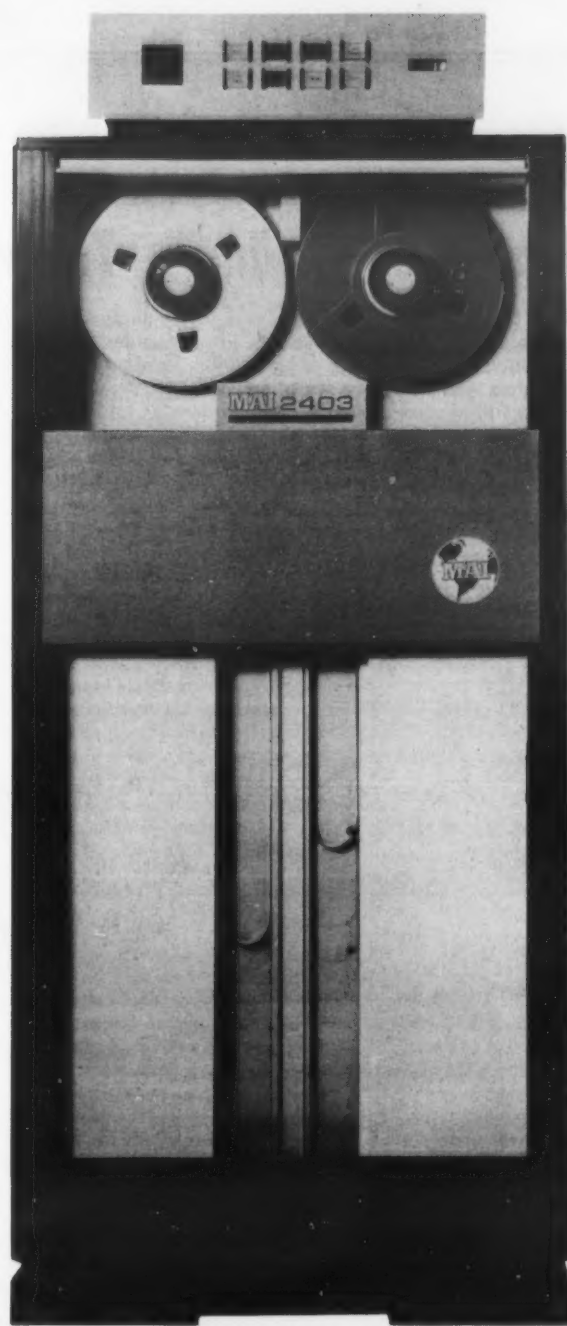
The "Utility Terminal" is described by the company as having both remote batch and conversational capabilities. Company-supplied software will provide communication compatibility



ty with the major large computer systems, according to the company, which is located at 4815 W. 77th St.



IBM 2401 Model 3 Tape Drive



MAI 2403 Tape Drive

# \$35,655

# \$16,400

Cost is one thing. Quality another. We win there, too. The MAI 2403 Tape Drive will do everything that the other machine will do except wear out tape.

With MAI, you don't have to worry about air pressure guides, tension arms, pinch feed mechanisms, mechanical brakes or other things that squeeze, jerk or stretch your tape.

That's all taken care of with a single capstan, vacuum tension and dynamic braking. Because the tape path is so uncluttered the MAI tape drive is extremely easy to load and operate.

And the magnetic read/write head is retractable. So your tapes are never subjected to unnecessary wear or abuse. The only contact with the oxide recording surface of the tape is at the head itself. And then only when the unit is actually reading or writing. During loading and rewinding, the head is retracted.

All MAI tape drives are designed to work with IBM's computer systems at high transfer rates. And they are interchangeable with the IBM tape drives on a plug-to-plug basis. In fact,

it's estimated that MAI now accounts for about 60% of the plug-to-plug interchangeable market.

Whether you rent or buy an MAI tape drive, you save on tape costs and you save on downtime caused by damaged tapes.

And there's that little matter of the price tag.

- ☐ I would like more information about the MAI 2403 Tape Drive.
- ☐ I would like a salesman to call me for an appointment.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

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Also offices in Mexico, Europe, South and Central America.

**For a demonstration, come to booth #110-111 at the Fall Joint Computer Conference.**

## Terminals on Display at the Fall Joint

### Terminal Uses Ordinary Television Set

SOUTHBORO, Mass. — A terminal that combines the conversational capability of a Teletype with the editing features of a CRT for \$3,500 will be shown by Alphameric Data Corp. at Sahara booth 19014.

The company, located at 11 Meadow Lane, says that the unit, which uses a TV set, is plug-compatible with units manufactured by Teletype, has an 1,800-character display (with a 72-character line), and brings in new text either on a line-by-line or page-by-page basis.

The new Model 33 can be used

in conjunction with a number of data sets to give a system data rate of up to 240 char/sec. It can be operated in one of three modes, the company says. In compose mode, the terminal is off-line, offering the ability to compose and edit a message prior to taking time on the central processor in actual transmission.

In conversational operation, the processor is tied up a good deal more for the character-by-character transmission; in this mode, the line-by-line roll-up comes into use. In batch mode, whole messages are composed

locally, and transmitted as units. Optional transmission of formatted information is made possible by the capability of protecting repetitive information, while only the variable data is erased after each use. A hard copy printer is optional, as is detection of parity errors.

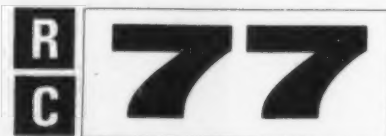
The manufacturer says that the CRT can be repaired by local television repairmen. Company personnel are required to make repairs to the keyboard unit. The unit is expected to be available for delivery soon with cassette tape readers, a punch, and hard copy.



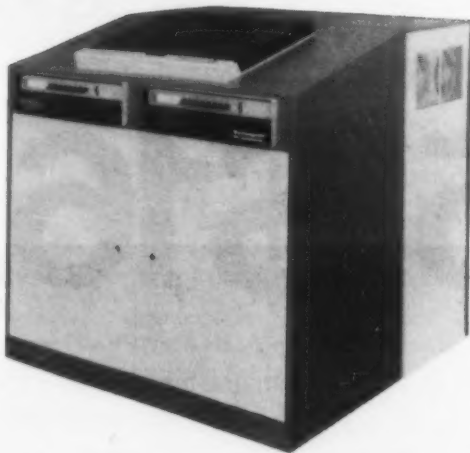
Alphanumeric Model 33 Video Terminal

If you're ordering a "Foreground/Background" system...  
**DON'T!**

**REDCOR's RC 77**  
**Synergetic\* Processor makes them all obsolete**



## Synergetic Processor



Incorporating two RC 70 Midi Computers, controlled by REDCOR's unique Synercizer, the RC 77 is the first significant innovation of the 1970's... an innovation that will influence the implementation philosophy of computer processing for years to come. The result is truly synergetic—the sum is greater than the parts.

\*Webster: "The simultaneous action of separate agencies which, together, have greater total effect than the sum of their individual effects."

#### Exclusive features of the RC 77:

- Simultaneous processing of real time tasks and batch jobs.
- Redundancy—100% uptime is assured.
- Software—Synergetic Software System (SSS), incorporating a real time monitor (RTM) and a batch processing monitor (BPM)
- Price—\$111,000; Rental—\$3,888 per month. System delivery—90 days.

SYNERGETIC PROCESSING—NOW A REALITY!

Complete Systems Capability

**REDCOR**  
CORPORATION

REDCOR CORPORATION/7800 Deering Avenue, P.O. Box 1031, Canoga Park, California 91304/(213) 348-5892

Get your free REDCOR at FJCC

### Cope .41 Monthly Rental \$2,090

DALLAS — The latest in the Cope line of remote batch terminals, the Cope .41, offers a 1,250 line/min printer and a 600 card/min reader. It will be shown at FJCC.

The monthly rental for the new unit is \$2,090, according to the manufacturer, Computer Industries, Inc., of 2659 Nova Drive, Dallas. The unit is designed for applications in which printing speed must be higher than reading speed.



The Cope .41 operates in full duplex mode, using a 4,800 bit/sec modem to access large-scale computers over voice-grade lines.

The communications controller is said to be capable of handling up to 10 terminals or separate peripherals, taking the burden of peripheral and communication control off the central processor. Cope terminals can be used with various large-scale computer systems, including the Univac 1108, IBM 360, and Control Data 6400, 6500, and 6600.

Besides the standard reader and printer, the unit can also use optional peripherals, including card punch, paper tape I/O, and IBM-compatible magnetic tape.

Field-upgradability is a feature of the full Cope line. Thus, the user of a smaller system need suffer very little downtime in conversion to a larger, faster model.

#### Display Terminals

BURLINGTON, Mass. — Two new lines of keyboard display terminals are being introduced by Infoton, Inc.

The models within each line vary in screen size (12 or 24 in.), width of display (32 or 64 char/line), and number of lines on the full screen (10 or 20).

The KDT-1 series is designed as a compatible substitute for tele-

(Continued on Page 38)



Mohawk 6401 Data-Recorder



MAI 100 Data Transcriber Model 2

# \$8,000

These key-to-tape machines do the same thing. But experts say the one that costs less does it better.

The MAI Data Transcriber has been designed for maximum reliability and ease of operation. For example, its true character display system simplifies verification by eliminating the need to mentally translate code into characters.

The tape (IBM compatible) loads automatically. Because the tape is contained in a cartridge, hand threading is eliminated. This increases operator efficiency and prolongs the life of the tape.

Tape movement is controlled by vacuum on dual capstan drives. Tape is transported in the same way as in third-generation tape drives.

The keyboard is similar to an 029 Key punch, which eliminates unnecessary retraining when converting from card preparation. The display console and tape cartridge are set at normal eye

# \$6,400

level and all switches are within easy access of the operator.

Whether you're renting or buying, for the highest quality sometimes you should pay less.

☐ I would like more information about the MAI 100 Data Transcriber Model 2

☐ I would like a salesman to call me for an appointment.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

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300 East 44th Street, New York, New York 10017  
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Also offices in Mexico, Europe, South and Central America.

For a demonstration, come to booth #110-111 at the Fall Joint Computer Conference.

## Terminals on Display at the Fall Joint

(Continued from Page 36)

typewriters, such as the ASR-33. Advantages in speed, quietness, and the ability to edit through the use of computer software are claimed. The units can handle data phone sets operating at speeds of up to 2,400 bit/sec, and can optionally transfer at speeds up to 8,600 bit/sec. KDT-1 prices start at \$1,495.

KDT-2 offers, additionally, full editing from the keyboard, and transmission upon command only. Format protection is standard. Using this feature, the operator has a picture of the form she is working with, and the unit will transmit only information meaningful to the computer, the company says. This series is priced from \$1,995.

On both series, options include hard copy printout and magnetic or paper tape I/O.

### Teletype-Compatible CRT

SALT LAKE CITY, Utah — Alpha 101, an 800-character, Teletype-compatible CRT computer display terminal, priced at \$3,495 will be displayed by BEI in Sahara booth 22015.

A stand-alone, single-unit package, Alpha measures 12-in. wide, 14-in. high, and 20-in. deep. It weighs 30 pounds.

A plug-for-plug replacement for a Teletype, it has an adjustable internal clock, making it possible to transmit data at any synchronous rate up to 2,400 baud. Since the output is fully compatible with EIA television standards, remote monitors can be added at low cost, the company says.

Twenty lines of 40 characters each — a total of 800 characters — can be displayed on the 11-in. CRT. The standard unit has a 64 character ASCII set, formed by a 5 x 7 matrix, plus controls for transmit, clear, four-way cursor direction, carriage return, repeat, and print. A ten-key numeric keyboard is optional.

All of the electronics are contained on four printed circuit boards for servicing or replacement, the company said.

Editing capability includes character delete, insert, and line erase. For example, fixed format data can be called up from the computer and displayed on the CRT. The operator can enter variable data and transmit the entire, or a portion of, the message. A print option is available where hard copy is required.

BEI is located at 1473 South 6th West here.

### Remote Batch Terminal

Scientific Control Corp. plans to demonstrate the capabilities of its DCT-132 remote batch communications terminal at FJCC booth 3800. The DCT-132, interfaced with a dial-up switched network, communicates with a central site computer in a remote location.

According to the firm, the internally programmable DCT-132 emulates the communications functions of the most commonly used data terminals, in most cases without modification of the central computer's operating system.

(Continued on Page 39)



Information International Graphic Console

## Display System Can Handle 6 Independent Consoles

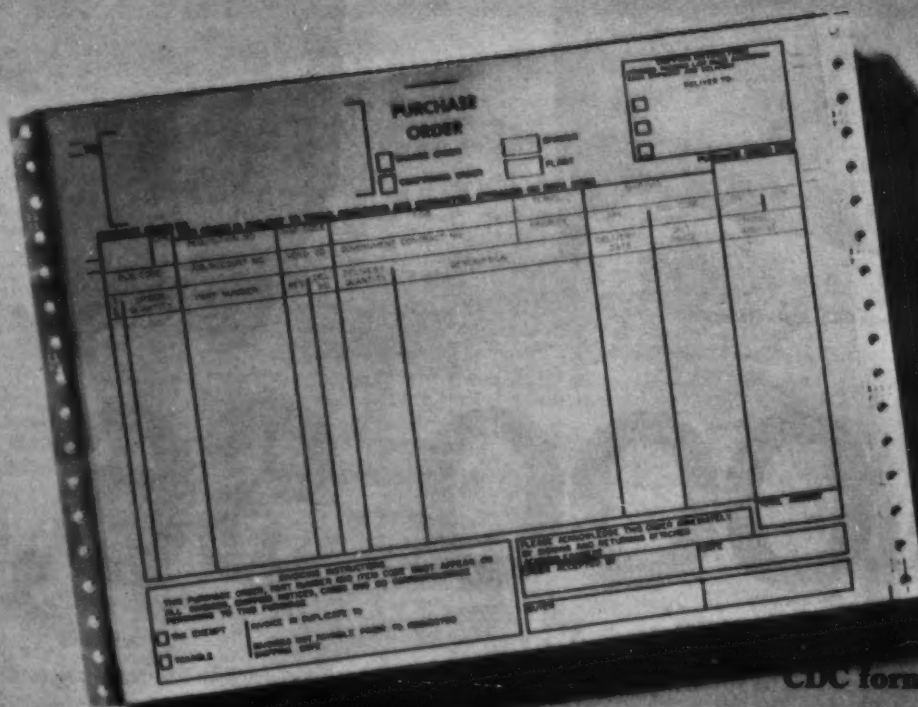
LOS ANGELES — The TDS 1060 graphic display system, consisting of a display controller interfaced to a computer and up to six independently operating display consoles, will be exhibited by Information International.

A system with controller, console, and one display is priced at \$70,950. The user interacts with the computer system via an alphanumeric or functional keyboard with function overlays, a 13-in. by 14-in. display, a light

pen, and rotating knobs.

It is designed to allow the user (designer, artist, programmer, engineer, accountant, or physician) to test concepts, vary graphic information, and insert text. Possible applications might include information inquiry and management analysis, engineering design, scientific computation, and process control and test monitoring. The company has offices in Los Angeles, Boston, and Washington.

## Scan these OCR forms.



CDC form.

# Terminals on Display at the Fall Joint

(Continued from Page 38)

Sending and receiving data at 2,000 to 4,800 bits/sec, half or full duplex, the DCT-132 is said to be capable of interfacing with a dial-up switched network or with a dedicated line. The modularity of the DCT-132 allows the peripheral controllers and peripheral devices to be added as required.

The basic DCT-132 is equipped with a synchronous communications coupler, 300 card/min reader, and a 300 line/min printer.

## Batch Display System

A display systems package featuring the Delta 1 display interfaced to a cassette tape recorder, card reader, and a printer, is

being shown for the first time at the FJCC by Delta Data Systems Corp.

The cassette recorder will allow local data storage, the company says, and the card reader will allow information to be fed onto the screen for formatting and data insertion. The printer will allow information to be selectively chosen from the screen for hard-copy reproduction.

Delivery of the Delta Batch Terminal is quoted as 60-90 days ARO. Prices start at \$7,500.

The DDS display system will be demonstrated at booths 6409-6410.

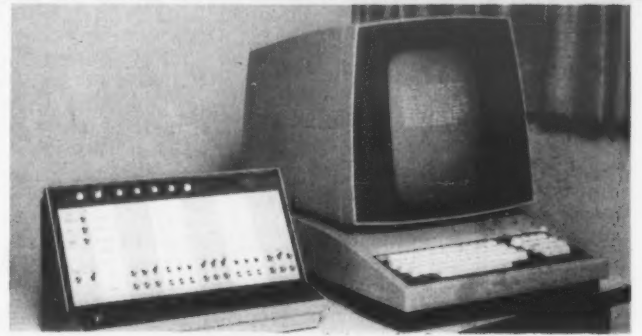
## S/360 Compatible

A Dids-400 digital information display system with plug-to-plug

System 360 compatibility is being introduced by Raytheon at the FJCC.

The new display does not require any hardware or software changes for use with System 360, the company says. In addition to total System 360 compatibility, Dids-400 is compatible with other leading digital computers.

The basic Dids-400 console consists of a keyboard and CRT display. The keyboard allows direct and immediate access to the memory of a large computer, the contents of which may be displayed on the screen. The console can be used for retrieval, updating, editing, monitoring, or executive inquiry, according to the manufacturer.



Imlac stand-alone display

## Terminal Is Stand-Alone Processor

WALTHAM, Mass. — A mini, designed to function either as a

communications terminal or as a stand-alone processor, will be introduced. The PDS-1, from Imlac Corp., is priced to sell for \$9,450 in single quantity down to \$6,545 in large lots.

The company, located at 296 Newton St., says that the new system, used as a terminal, can replace any on-line electro-mechanical device without the need to modify either the central system or the present communications facilities. Pre-programmed to simulate the characteristics of the terminal being replaced, the PDS-1 can function at rates up to 9,600 bit/sec, using any bit structure or code level, the company says.

The basic configuration has a 4K processor (16-bit words), with a cycle time of 2  $\mu$ sec. Also included in the basic price is direct addressing to 2K, with indirect addressing above that level. Eight index registers and one general purpose register are standard. Memory can be incremented, in 4K pieces, to 32K, the company says.

The transformation from display to mini is accomplished by plugging in a small console, the company says.

## CRT Display Offered For Digital PDP-15

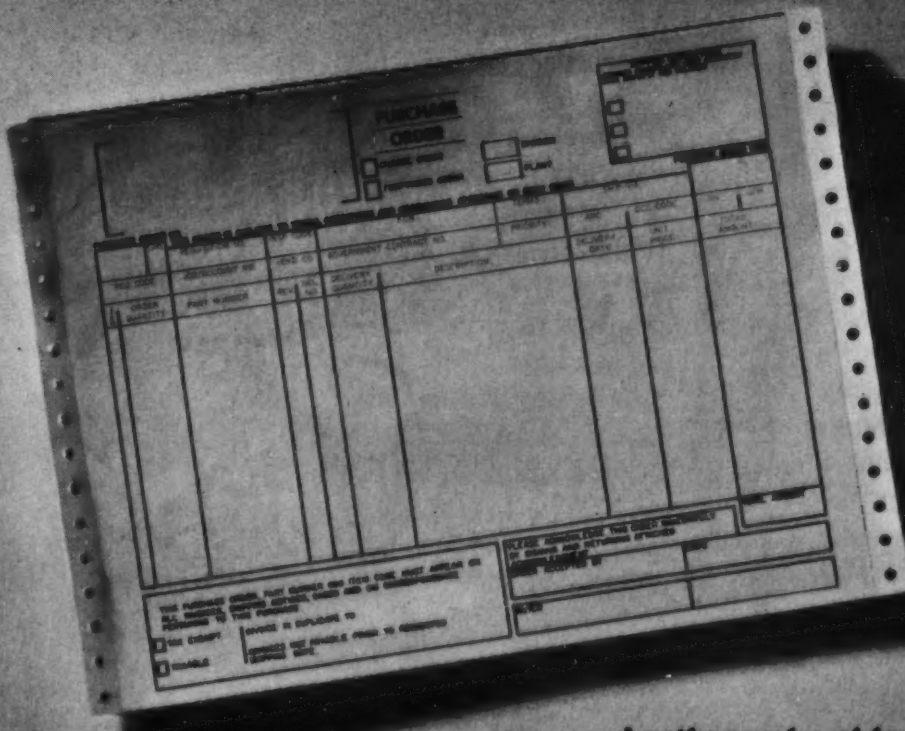
MAYNARD, Mass. — A demonstration of the VT15, a new interactive display system designed for the PDP-15, will highlight the Digital Equipment Corp. exhibit at booth 6000 at the FJCC.

The display system, which includes a graphics display processor and display console, will sell for \$18,900.

The VT15 has a standard 17-in. CRT display, a 68-char. central hardware generator, 6 function buttons, an 8-directional vector, a hardware program counter, and flicker-free characters that display in an average 8  $\mu$ sec time, the company says.

The VT15 system can be used in graphic research, design engineering, architecture, business information systems, and other uses requiring a fast, low-cost display.

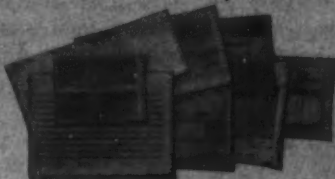
Also to be shown at the booth will be a fail-safe, special purpose, time-sharing system that includes a PDP-8/L computer. The four-user system's per-terminal cost is said to be lower than many sophisticated desk calculators, and less than the annual rent of a time-sharing terminal. The system uses the Focal language.



Another make of form.

## See the difference?

Both forms look pretty much alike. But there is one subtle difference. The one on the right won't work. It's printed on the wrong type of paper with an improper ink formula, the spacing isn't precise and the trim is off just a hair. It may not be a bad form for some uses. But it's not right for optical scanning.

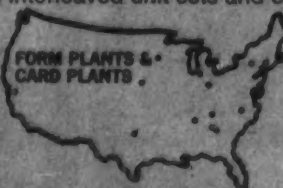


That's a problem you (and your OCR equipment) won't have with Control Data. We make optical scanning systems. And we also make forms for just about every conceivable data processing application. With that kind of background, we know what an OCR system requires to operate efficiently and trouble-free. And we're supplying OCR forms that work to users across the nation in a variety of sizes and styles including con-

tinuous forms, carbon interleaved unit sets and cut sheets.

If you have a forms problem — for an OCR or any other kind of data processing system — let us know. We have the experience and know-how to develop creative forms that will simplify your operations — cut costs, time and paperwork.

Write or circle the number below today. We'll send you all the details, and put you in touch with a Control Data computer supplies specialist near you.



**CONTROL DATA**

Business Products Group  
Dept. 135  
Control Data Corporation  
4570 West 77th Street  
Edina, Minnesota 55435

## Services Being Demonstrated at FJCC

### Exec 8 System Will Be Tied To Paramus, N.J.

NEW YORK — A demonstration of the Univac 1108 Exec 8 time-sharing system will be conducted between Las Vegas and Paramus, N.J., by Access Systems, Inc., at the FJCC.

The system will be on-line from its exhibit to the computer center in Paramus. To show how the Exec 8 time-sharing system works through a wide variety of terminals, the computer center will be on-line with several acoustically coupled Anderson

Jacobson teletypewriters located in the Access Systems booth in addition to the Computer Terminal Corp.'s Datapoint 3300 visual display operating at 30 char/sec at the CTC booth and the higher-speed remote batch DCT 132 at the SCC booth, the company says.

The company's complete range of software packages, including Fortran V, Text Editor, Basic, APT, Algol, Conversational Fortran, Cobol, and a data base management and retrieval system, will be demonstrated using the various terminals at booth 8109.

### UCS Using CDC 6000

KANSAS CITY, Mo. — United

Computing Systems, Inc. will demonstrate its new computer service system, UCS VI, for the first time at the 1969 FJCC.

Two major elements mark UCS VI: the immense central processor/storage capability of a CDC 6000 series computer and on-line availability in major cities for multiplexed time-sharing (toll-free) and remote batch processing.

Adjunct services include national database applications, on-site batch processing, business and science applications programming, software development, and systems design, the firm says.

The demonstration is to be in booth 8515.

### APL Time-Sharing

VAN NUYS, Calif. — APL will be demonstrated through the APL Computing Services' display at the FJCC.

The language, based on a notation system developed by Dr. Kenneth E. Iverson, will demonstrate its flexibility, according to the company, through its ability to use simple programs. A 700-statement Electronic Circuit Analysis Program that took 7,000 statements in Fortran will be used to compare performance.

The system will be demonstrated in booth 27001.

### Allen-Babcock 'Rush'

LOS ANGELES — Several new

features of Allen-Babcock Computing's Rush system will be on display at the company's FJCC booth.

Included are the new file organization (Fore) system for the Rush environment, electronic circuit analysis packages, and the new Rush text editor, the company says.

An additional demonstration — the company's ability to drive the Calcomp 565 plotter — is slated for exhibit at the company's booths 5007-8.

### Software Analysis

NEW YORK — Two of the major services of System Interaction Corp. — Software Contractors Credentials and Capabilities, and Software Packages and Encyclopedic Guide with Operational Analysis Reports — will be on display at the company's booth.

The guide includes a listing of many of the available software packages and the basic criteria for use of the packages. The packages are indexed by type of application and computer system.

The Reports include capability descriptions and reports regarding use of the packages.

The Contractors, a new service, gives specialized skills, staff profiles (including billing rates and experience levels), development skills, languages, and equipment familiarity.

The notebooks will be on display at booth 6705.

### Keyboard Training

NEW YORK — Keyboard Training, Inc. (KTI), specialists in on-site and/or training center retraining and training on keyboard equipment of all types — keypunch, magtape, encoders, CRT, calculators, tape perforators, typewriters, etc. — will have an exhibit at the conference. The firm will demonstrate what its services can do to reduce the error factor and increase the productive capacity of all operations dependent on keyboard operators, the company says.

The exhibit will feature an audio-video presentation demonstrating its services and capabilities — including those of three new divisions, the data processing services division, the newspaper and printing division, and the social programs division.

The film can be seen at booth 3304 at the Sahara.

### Franchised Services

NEW YORK — Information on the franchised data processing service bureau operations for small businesses will be available from Data Power, Inc. at its FJCC booth.

The systems employ batched time-sharing from over 150 centers currently under franchise, the company says.

Prices for franchises range up to \$30,000 with financing available, the company says.

Data Power, Inc. will be in booths 8418-19.

# SCORE™

File Management

The Cobol Information Retrieval & Reporting System

"As a result of the computer manufacturer's separate pricing policy, SCORE will eliminate the need to purchase file to file utilities. We will therefore realize savings we had not anticipated."

Woodward & Lothrop  
Washington, D.C.

"The COBOL feature is most useful. Modification of a program already prepared requires far less time than writing it from scratch. Our savings so far in the use of SCORE have exceeded our expectations."

Wyandotte Chemicals Corp.  
Wyandotte, Mich.

"I estimate systems can be implemented from 40% to 50% sooner with SCORE."

Enjay Fibers and Laminates Co.  
Odenton, Md.

"The average turn-around time for six job requests was two hours. The programmer assigned to these projects stated that with more experience he could produce the desired results in less time."

The Torrington Company  
Torrington, Conn.

N.Y.C. & L.A. contact  
Edward Opengart, Vice Pres., 212-889-4200  
Stephen Speicher, 213-479-4338

All other areas contact  
Robert P. Wolk, Vice Pres., 215-925-8424

**Programming Methods Inc.**

51 Madison Avenue  
New York, New York 10010



**Atlantic Software Inc.**

Lafayette Building, 5th & Chestnut Sts.  
Philadelphia, Pa. 19106

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COMPUTERWORLD

# If Honeywell disk packs aren't 100% error-free, then it don't snow in Minneapolis in the winter time.



We know a lot about the snow in Minneapolis.

We know a lot about disk packs too. After all, we're the "Other Computer Company."

So it's not surprising that our disk packs are so good.

We offer the flattest surfaces in the industry.

We've eliminated flagged tracks.

And every Honeywell disk pack is 100% error-free.

Anyone can use them. Because we have a full line that's compatible with any make of computer.

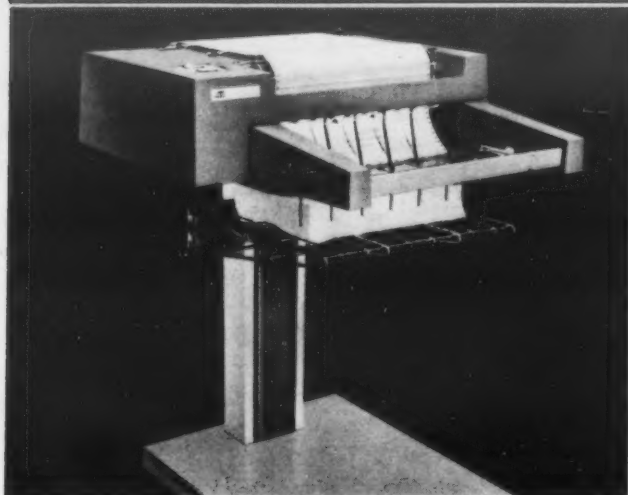
And we can deliver as soon as we get your order.

If you'd like to know more, call your local Honeywell Communications and Data Products representative. Or our home office, collect, 617-235-7450, extension 531. We'll give you a disk pack you can count on.

Sure as little green apples.

## The Other Computer Company: **Honeywell**

## FJCC at Las Vegas



Formstacker

### Formstacker Will Handle Printer Output

MAPLE GLEN, Pa. — A new gadget for controlling the stacking of printed output from computers, at up to 80 in./sec is being introduced at the FJCC by Advanced Terminals Inc.

The form stacking unit handles the paper output of high-speed computer printers. The unit rolls up to any high-speed printer without special setup, according to the firm.

At the conference, the company will have a printer simulator that can be adjusted to eject paper at the same rate as any commercially available printer. The demonstration is slated to

show how the formstacker accepts any continuous fan-fold form at print rates to 2,000 line/min and skip rates to 80 in./sec.

The company claims that the stacker avoids costly downtime normally needed to straighten, refold, and untangle forms. The unit takes any form, including 11-lb, single-part paper, in widths from 4 to 18 in.

Forms stack into a wire tray that lowers automatically as the forms fold in, taking an entire box of paper (up to 15 inches depth) in a single load, the firm says. An automatic alarm

sounds when the tray is full. Open-side design lets the operator remove the stack while the printer continues running.

Frank S. Caulfield, company president, says the formstacker, which sells for \$1,600, will increase any printer's throughput by at least 35%.

The exhibit and demonstration at the show will be in booth 11005.

### Hybrid Systems To Show Analog Digital Unit

HOUSTON — Hybrid Systems, Inc., a subsidiary of Scientific Resources Corp., will exhibit a hybrid computing system at the FJCC.

To be exhibited in booth 13000, the computing system will consist of Hybrid Systems' SS-100 analog/hybrid computer with interface and an XDS Sigma 5 digital computer. The SS-100 and hybrid linkages are compatible with almost any digital computer, the company says.

Various problems demonstrating the real-time computation capability of the SS-100 will be simulated. These include: partial differential equations and multi-function variables.

A third-generation, 100-volt computer, the SS-100 features reliable wide bandwidth components and integrated circuit switching logic necessary in high-speed iterative/repetitive operation. In addition, the SS-100 is modular in construction; that is, the number of components can be expanded by simply plugging in additional ones.

Controls and display devices are grouped to allow easy operation, the company says. A modern desk-type control console contains the readout devices, indicators, and control pushbuttons.

In addition to being purchased, the SS-100 and linkage can be leased from one to six years.

A total hybrid system is also available under the new computer resources purchase plan of Scientific Resources Corp. that allows the user to purchase the computer on a monthly installment basis. The plan results in considerable cash and cost savings compared to leasing, the company says.



Hybrid Systems' SS-100, a third generation analog computer, reflects recent developments in both electronics and computer fields.

## Refreshingly New...But Not New



### The Ultra Slender — Under \$3500 — CRT Terminal from BEI

Refreshingly new—but not new. This slender, sophisticated CRT computer display terminal from BEI.

Refreshingly new in contoured design compact modularity and low, low in price. Just \$3495 in single quantities.

Not new because BEI has quietly delivered scores of display terminals to major hospitals over the country—as part of BEI's advanced intensive care and patient monitoring systems.

Alpha 101 can directly replace a Teletype. Just plug it in and start communicating. It's faster, with adjustable speed data transmission to 2400 baud. Quieter, smaller, smarter looking, much more functional too.

With MOS memory and MOS character generation, 800 razor-sharp alphanumeric characters—20 lines of 40 each—are displayed on the 11-inch CRT. Alpha 101 has a 64 character ASCII set, 4-way cursor control, character and line editing and EIA TV compatibility for low

cost remote monitoring. Plus important options such as hard copy printout, computer formatting, and 10 key numeric keyboard.

Meticulous care has been given to the smallest details. Like concealed nylon roller bearings which permit Alpha 101 to be swiveled without scratching the desk. A clean back panel, with hidden power cord and connectors, making Alpha 101 look great from any angle. A contemporary contoured cabinet so Alpha 101 can easily be lifted from underneath. And a wide range of decorator colors.

There is much more to tell. Write or phone today for the full color brochure on Alpha 101—the first in a complete series of modern computer display terminals.

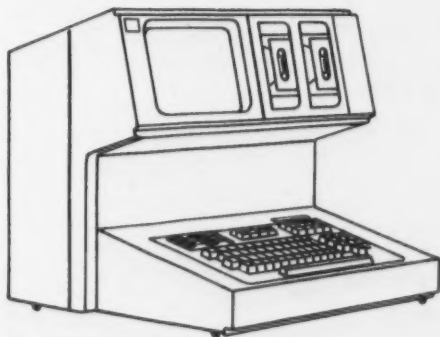
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Each machine has a mini-computer that we program to fit your business. It guides the operator step-by-step and "beeps" when a mistake is made. It can cut errors by 90 percent. It will search a

file, sort information, and copy records. The custom keyboard is simple to use. The video screen shows everything in familiar form for checking and editing. And it's all recorded on handy tape cassettes — no cards, no paper, no mess.

Our terminals work harder to make things easier for people.



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# Fall Joint at Las Vegas

## Prototype Designed to Emboss, Encode

MINNEAPOLIS — A new design concept in credit card embossing and encoding equipment will be introduced by Data Card Corp. A prototype of their Series 1500 will be displayed.

The Series 1500 prototype is the first of a planned group of modular systems, ranging in production capability from 500 to

3,000 cards per hour, according to the company. The 1500 series system is designed for operating speeds of 1,500 cards per hour.

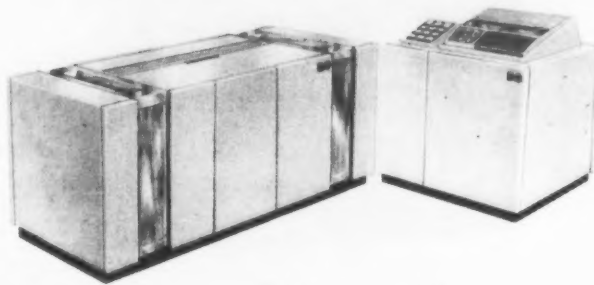
Design features will provide not only higher production rates, but quieter operation, increased reliability, and easier maintenance, the company says. As a result of increased production speeds, Data Card Corp. expects lower cost per completed card and quicker completion of peak-load production runs, with embossing costs reduced by up to 50%.

Data Card systems will provide three computer compatible in-

put systems — magnetic tape, paper tape and punched card — to provide input without expensive data conversion. Similarly, modules will be designed to emboss cards, punch coded holes, or encode cards with a magnetic strip.

In addition, Data Card equipment claims error checking through parity checking on internal data transfers and echo checking on mechanical operations, thus virtually eliminating possible equipment-generated errors.

Data Card Corp. will be located at booth 36010, Sahara Hotel.



Data Card Corp. Series 1500

## Wang Calculator Holds 960 Steps For Program

TEWKSBURY, Mass. — Wang Laboratories' new Model 700 programmable calculator features core memory that will hold a block of up to 960 program steps; a tape cassette with a capacity of 20 such blocks; 120



registers; each able to add, subtract, multiply, and divide; fast execution; commands for looping, branching, subroutines, and decisions; and a substantial number of algebraic and geometric functions, the company said.

The unit is designed to give engineers and scientists the ability to perform a number of standard functions (such as differential equations, Bessel functions, and Fourier functions) without going into a computer and tying up its more expensive facilities or waiting for a queue to free up.

## Fast Fourier Transforms Easy For Time/Data 90

SAN FRANCISCO — A special-purpose computer for processing Fast Fourier Transforms is scheduled for exhibit by Time/Data.

The 90 system costs less than \$40,000. It can process a 128-point transform in 3 msec, going up to 56 msec for a 2,048-point transform.

Using its own core memory, it is said to have a throughput rate of up to 40,000 word/sec. It can process data in a continuous stream or in individual data blocks, and can operate independently of the host processor.

The algorithm set is said to include Fourier Transform, Inverse Fourier Transform, Auto Spectrum, Spectral Averaging, Linear Hanning, and Quadratic Hanning.

Options include an analog-to-digital converter, a computer interface, display coupler, and a CRT display.

Deliveries are scheduled to begin in the last quarter of this year.

## If your office isn't exactly surrounded by good keyboard operators, we can train as many as you need.

We specialize in increasing the productivity and accuracy of computer input equipment operators — experienced employees as well as new operators.

For example, when the Book-of-the-Month Club moved its offices to Camp Hill, Pa., they discovered there weren't enough keypunch operators available. So they called us in. And we trained the operators they needed from scratch. In just three weeks.

We increase the productivity and accuracy of existing operators, too. We do it by reducing operator errors by 50% to 80%. And by increasing speed from 15% to 40% with corresponding expense savings.

Computerworld concluded, in an independent study, that the average increase in operator productivity is 22%.

So it's no wonder that top Fortune companies like AT&T, and Mobil Oil use our services. So do 4 of the top 5 banks listed by Fortune. And 8 of the 10 leading insurance companies.

We train for whatever type of keyboard-operated equipment you have. Key punch, magnetic tape, typewriting, CRT, calculating, etc.

### How we do it.

KTI has the specialized talent, techniques, and materials. Also, our training is "operator oriented" instead of "machine oriented."

### Where we do it.

KTI is unique. We do not operate schools or conduct classes in the usual sense. We work only with employers.

KTI trains on-the-job or off-the-job. Our professional instructor will work with your operators on your own equipment and primarily on your own documents.

### What it costs.

The amount varies. But savings in the first year usually exceed five times the investment. So the service pays for itself in 9-13 weeks.

### Free consultation or appraisal.

For a free consultation about KTI, or a brief appraisal of your present operators, write or call us. Then, you can have as many great keyboard operators as you need. No matter where you're located.

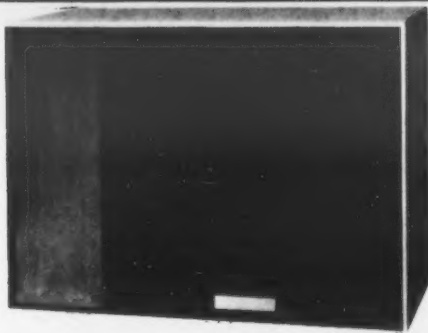
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## Communications at Las Vegas



### Sebit-96 Used in Point-to-Point Network

SILVER SPRING, Md. — Rixon Electronics will exhibit a new data set at the FJCC.

The Sebit-96 is typically used with computers or other high-speed terminals in a point-to-point private line network, the company said.

The machine, which operates at switch selectable rates of 9,600, 6,400, and 4,800 bit/sec

over voice grade telephone circuits, contains a fully automatic, continuously adaptive equalizer, the firm stated.

The Sebit-96 accepts a serial digital data signal from a data source and converts that information to a modulated signal suitable for transmission over a voice frequency channel. The receiver accepts the modulated

signal and demodulates it to the original serial data signal, the company said.

The Sebit-96 will be displayed in booths 108 and 109.

#### Univac 1108 Interface

LOS ANGELES — A new terminal access unit (TAU) from Intranet Industries, Inc., will be demonstrated at a Las Vegas hotel suite.

The Model 6213 serves as the interface between the Univac 1108 computer and the terminal units in time-sharing computing systems. In its standard configuration, the TAU 6213 can accommodate up to 32 serial teletypewriter data channels on one Univac 1108 input/output channel.

The TAU 6213 is said to fully automate the functions involved in transferring data from the public telephone system to the computer.

Among the functions performed automatically by the TAU 6213 are answering and disconnecting calls from user terminals, under complete control of the 1108 software.

#### Network Control

WASHINGTON, D.C. — Universal Systems Inc. will exhibit its new Network Control Processor (NCP), a modular high-speed front end for third-generation IBM and Univac computers, the company said.

Designed to direct the interchange of data between remote terminals and a large scale central computer, the NCP includes all necessary hardware and software, the company said. It operates with all IBM 360s from the Model 30 up and with the Univac 1107 and 1108.

The product will be on display in booths 19004 and 19005.

#### Acoustical Enclosure

TARAZANA, Calif. — A 50% reduction in detectable noise can, the company claims, be achieved through the use of a new enclosure for Teletype Model 32 and 33 teletypewriters. The unit will be exhibited for the first time at the Novation, Inc. FJCC booth.

A noise-level reduction of 10 decibels, which represents a 50% decrease since the decibel scale is logarithmic, is about two-thirds of the noise made by a standard office IBM Selectric typewriter, the company says.

The TE/33 includes a built-in fluorescent lamp to improve visibility, a noise-free fan for cooling, and decorator colors for the contemporary enclosure.

The TE/33 is available with a built-in acoustical coupler, the company claims, or can be ordered with any standard coupler.

Purchase price for the unit is \$395, and it can be leased for \$15 per month.

The enclosures will be on display at booths 27007-10.

See us at Booth #6600 at the FJCC.

People know us as the memory company. We make the finest, fastest, most reliable drum memories available. And people who know us aren't surprised to hear about the new controller we've introduced. It was a logical step. Now there's a direct connection of our drum through our controller to your computer.

**Two new memories, too.**

We're also introducing new memories at both ends of our present line. The 1001 with a 1 million bit capacity, and the 2064 with a 128 million bit capacity.

People who know us aren't surprised to see the memory company expand. But maybe there are some people who don't know us at all. Those are the people we'd really like to help with their memories.

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We had to form a brand new company to do it, but now we can announce a minor millennium:

# the under- \$50K COM

The nice thing about important announcements is that you really don't have to say much. So here are three pithy points:

1. We input standard IBM 360 magnetic tape format,
2. We're printing at the rate of 13,000 lines per minute—offline,
3. We output on to 16mm microfilm.

Our company is  
Peripheral Technology, Inc.,  
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Sunnyvale, California 94086.  
Telephone: (408) 732-4940.

(Oh, by the way, that under-\$50K price does include the tape unit.)



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INCORPORATED**

# The under- \$50K Specs:

PTI's Model 1300 Computer Output Microfilm System operates as an off-line system, allowing parallel computer operation. It prints alpha-numeric data on 16mm microfilm in computer page format.

Takes IBM compatible 9 track magnetic tape input with 800 B.P.I., NRZ recording, standard line printer format for full compatibility with existing systems, and fixed length records, blocked or unblocked.



It outputs on 16mm microfilm in standard computer page format at 132 characters per line and 64 lines per page. Printing rate is 13,000 lines per minute with throughput at 156 to 500 pages per minute.

A basic set of 64 characters is expandable to 128.

Reliable standard features include: vertical and longitudinal parity checking, re-read on parity error detection, built-in test generator for high speed maintenance, individual files that can be selected and printed from tape, IBM compatible EBCDIC input code, a void frame mark, film fault and film remaining indicators, and a frame counter that can be reset by the operator. It takes 600 foot rolls of non-peforated microfilm, has vertical tabbing and variable film pulldown.

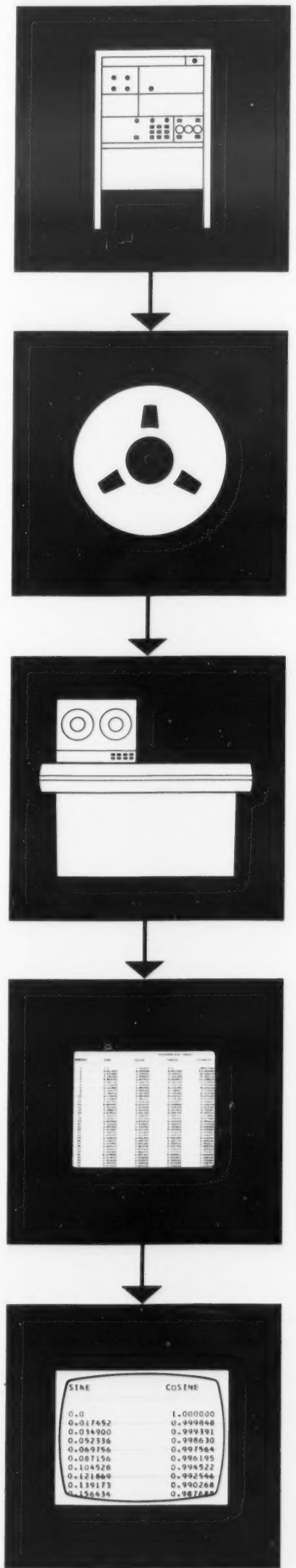
Optional features include, forms flash, image retrieval, card reader for high speed set-up, 7 track tape transport, B.C.D. coding, and a print list mode.

The PTI Model 1300 COM System, including magnetic tape unit, sells for \$49,750.00



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Phone (408) 732-4940.







## Communications at FJCC

### GE Introduces Four Acoustic Data Sets

LYNCHBURG, Va. — Four new DigiNet acoustically coupled data sets in the TDM-114 and TDM-115 Series are being introduced by GE's telecommunication products department.

#### Locks Receiver

A twofold handset/modem mating device locks the tele-

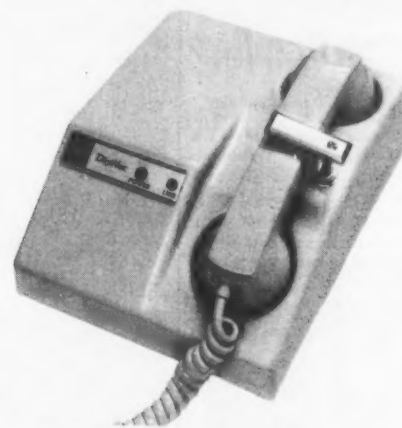
phone receiver into the modem for positive telephone coupling and more reliable signal transmission, the company says. A spring-loaded clamp holds the handset firmly and prevents uncoupling. Twist-lock action automatically activates the DigiNet data set when the locking arm is swung into place.

The new clamp arrangement

also provides four to five pounds of pressure at the matching interface between the handset and acoustic seals on the data set. This reduces ambient noise pick-up and vibration, resulting in less signal interference, according to GE.

These units comply with tariffs covering use of acoustic couplers on the switched network, the firm says. The units are compatible with Western Electric 103A2 and General Electric's TDM-110 and TDM-111 data sets.

The units will be displayed at booth 5920.



GE Acoustical Data Coupler

### 1130 Communications Option Offered

NEW YORK, N.Y. — A new turnkey system that provides the IBM 1130 with communications capabilities will be shown by Telematics, Inc.

The system, Telematics 578, is made up of a 64-line communications adapter and a software support package. Through a simple plug connection to the IBM 1130, it enables the computer to utilize a greater variety of remote terminal devices than previously possible.

Other capabilities added by the Telematics 578 are: store and forward message switching, front end and remote concentration to the IBM System/360, expanded remote job entry, data collection and dissemination, and on-line inquiry. It also provides for the use of standard IBM 360 disk and magnetic tape peripherals and communications interfaces.

According to Laurence Levine, executive vice-president of Telematics, Inc., the basic Telematics 578 system will lease for approx-

imately \$4,200 a month.

The equipment will be on display in booth 31003.

## A GIANT IN THE FIELD... ... introduces **TERMICORDER**

A totally new incremental, magnetic tape Recorder/Reproducer that completely replaces punched paper tapes for Data Terminals. See it—Booths 7204 & 7205 Fall Joint Computer Conference.



#### Data Concentrator

IRVINE, Calif. — A new data concentrator system will be introduced by Varian Data Machines.

The Varian 520/DC system is designed as a concentrator for interactive time-sharing networks. The system gathers data from a number of local, low-speed terminals and concentrates it for economical transmission over one or more high-speed lines to a distant computer center, the company said.

The system also can serve as a communications preprocessor, organizing incoming data for direct entry into a large computer or dispatching data from the computer over a number of communication lines.

It will be on display at booths 101-107.



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## Communications at FJCC

### Communications Computer Handles Multiple Stations

INGLEWOOD, Calif. — A new product in the communications line will be introduced by Computer Communications, Inc.

The CC-70 programmed buf-



One of CC's new series of communications processing systems.

fered multiplexer is the first in a new series of communications processing systems, the company said. The CC-70 will handle up to 128 communications lines. With multiplexing software, it can handle multiple communications stations using series 100 or 200 data sets.

The CC-70 uses existing interfaces to a variety of computers, including the IBM 360 and 1130 computers, the SDS Sigma series, and the CDC 3000 and 6000 series, the company said.

The company's products will be on display in Booths 4401-4404.

### I/O Controller Used for Front End Multiplexing

ANAHEIM, Calif. — A new input/output controller will be demonstrated by Tempo Computers, Inc.

The new equipment is used for remote communications concentration or front-end multiplexing, the company said. The concentrator and multiplexer, which utilize the basic hardware of the Tempo I modular computer system, are the same, except for the main computer interface.

The concentrator is made up of a Tempo I control processor, two 4K x 16 primary memory units, and full duplexed synchronous communications multiplexer and modem controller. The synchronous modem operates at speeds up to 10 kilobaud and the asynchronous up to 4.8 kilobaud. It incorporates sync character detection and generation as well as automatic parity detection and generation, the company said.

The front-end multiplexer version utilizes a hardware interface in place of the synchronous controller. The units are completely under program control.

This equipment will be on display in Booths 8505 and 8506.

The company will also display the Tempo I modular system.



DSC's Multiplexer

### Multiplexer Links 120 Remote Terminals

GLEN ROCK, N.J. — A new multiplexer developed by Dynalec Systems Corp. will be on display.

With the unit, simultaneous data communications between 120 remote terminals and a central computer over a single voice grade line is possible, the company said.

Optional input circuitry makes it possible to handle higher speed data entry devices operating up to 2,400 baud. The basic unit provides 32 low-speed and one synchronous voice grade channel. Additional line modules can expand the capacity to 120 channels, in 8-channel increments, the company said.

A line adapter unit, with code and data rate selected by the user, is supplied for each communication line, the company added. Another feature of the Dyne-Com 70 is its ability to handle up to four different low-speed data rates and codes.

This equipment will be exhibited in Booths 6418-6419.



## Certifiers and Evaluators

### One Cycle Cleans and Evaluates Tape

RESTON, Va. — A new selection of magnetic tape cleaners will be exhibited by General Kinetics, Inc., at the FJCC.

The GKI tape cleaner-evaluator completes the cleaning and evaluation operation in a single cycle, the company said.

The tape is tested at 800 bits/sec (or less), and it takes

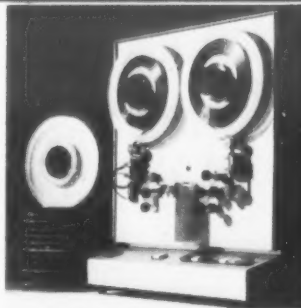
approximately six minutes for a two-pass clean-test cycle at an average speed of 150 in./sec. On the reverse pass the tape is tested for dropout errors, which are then registered on a front panel counter, the company stated.

A recorder that indicates the exact location of the errors on the tape is available as an option, the company said.

The 800-bit/in. model is priced at \$7,495, a company spokesman said.

The Model 580 magnetic tape cleaner and the Model 999 computer tape cleaner will also be shown. Both models feature a new self-sharpening rotary cleaning blade, the company said.

The products will be on display in Booths 4301-4302.



GKI tape cleaner-evaluator

### Performance Test Device Improved

SANTA MONICA, Calif. — The CPM II, a computer performance monitor, will be displayed by the Heuristic Systems division of Allied Computer Technology, Inc.

Improvements incorporated in the second generation CPM include: a real-time clock, provided to eliminate the use of one of the counters to keep track of elapsed time. All 16 counters have been extended from six to ten decimal digits. Five input data switches have been installed.

The standard magnetic tape unit has been upgraded from 7-track, 556 bit/in. to 9-track, 800 bit/in., and a two-wire probe, capable of sensing most signals known in data processing, has been added, the company said.

The CPM II can be leased or purchased.

The monitor will be on display in Booth 8516.

#### Disk Pack Tester

OKLAHOMA CITY, Okla. — A new disk pack tester will be exhibited by California Data Systems.

Developed by Interscan, Inc., a subsidiary of California Data Systems, the DPT 600 incorporates a new "dual threshold" error capturing design. This design enables it to identify both soft (or marginal) and hard (minimum acceptable criteria) errors concurrently, the company said.

No test cycle stop is required to measure soft errors because a complete profile of each pack may be printed out on an optional digital printer, giving error type and track location, the company stated.

The DPT 600 has five modes of operation: automatic, automatic reject, semi-automatic, manual, and special test.

The DPT 600, priced at \$20,800 including installation, may be leased or purchased, the company said.

The company will exhibit the DPT 600 in Booth 8105.

#### Peripheral Monitor

MENLO PARK, Calif. — A new disk and drum monitoring system will be exhibited by Royco Instruments, Inc.

Royco's Automatic Aerosol Particle Monitors can predict wear in a mechanical memory system, the company stated. The prediction and prevention of head crashes or wear failure is accomplished by monitoring the increase in particles manufactured by the memory system itself.

Automatic liquid monitors for use in hydraulic systems to measure the efficiency or performance of a liquid system will be exhibited at Booth 8507.

#### Tape Evaluator

MOUNTAIN VIEW, Calif. — Three products utilizing capstanless tape transports will be exhibited at Booth 8507.

## Here's another good reason our time-share system is the most popular around:

## 90-day delivery!

You don't have to play the waiting game when you order our HP 2000A Time-Share System. It's ready for you almost as soon as you're ready for it. In most cases, you can take delivery 90 days after we get your order.

But getting customers on the air fast is just one reason for our system's success. There are plenty of others.

Like price. Our system costs only \$90,500. Yet it handles 16 remote terminals simultaneously. This alone gives it one of the lowest costs per terminal-hour in the industry. And the modest initial investment is matched by the 2000A's remarkably low operating cost. Overall, it's the most economical time-sharing system going.

Simplicity is another reason for our system's popularity. HP BASIC is the easiest computer language around. That's why it's a favorite with scientists, engineers, educators, businessmen and other non-programmers. They can learn it in just a couple of hours, because it's almost like talking to the computer in English. Yet because the HP 2000A is so powerful, these users can put it to work on such sophisticated operations as matrixes, strings, and files.

The HP 2000A comes ready for your immediate use. All required software, control terminal and interfaces are included. And this system keeps on working and working and working. In fact, our customers have already logged over four million terminal-hours of successful, trouble-free operation.

With this kind of money-saving reliability, it's no wonder our time-sharing system is the most popular one around.

Need further proof? Call your local HP computer specialist. Or write to Hewlett-Packard, Palo Alto, California 94304; Europe: 1217 Meyrin-Geneva, Switzerland.

HEWLETT  PACKARD  
DIGITAL COMPUTERS

## Microfilm Equipment at the FJCC

### Computer-to-Microform System Demonstrated

ENCINO, Calif. — A new computer-to-microform product developed by Computer Micro-Image Systems, Inc., will be demonstrated.

The CMS-7000 computer output microform system accepts alphanumeric data on-line or off-line from magnetic devices at data rates up to 300,000 char/sec and prints on any microform at 120,000 char/sec, the company said. Page-printing rate is up to 900 pages/min.

The character generation of the

CMS-7000 is stroke, italics, boldface, lower case, and three size-changes may be mixed in the same line of print.

A microfiche camera is available to handle tough information publication problems, the company said. Up to 32 rows by 32 columns of pages may be recorded on 105mm fiche up to 8-in. long in any sequential or random order.

The CMS-7000 will print up to 255 char/line and 127 lines/page, the company stated.



CMS-7000 Microimage system

The system is designed for hands-off operation with all variables controllable by the computer including character size, scale factor, and record length. The company will exhibit it in Booth 28006.

### Output Microfilmer Superimposes Forms, Computer-Generated Data

NEWTON UPPER FALLS, Mass. — The computer output microfilmer developed by the Beta Instrument Corp. will be shown at the FJCC.

The basic system of the Beta Com 600 includes a 7- or 9-track 556/800 bit/in. tape transport, a dedicated 12-bit 4,096-word general-purpose digital computer, an ASR 33 Teletype, a CRT display and controller, and a 16mm or 35mm microfilm camera.

The 600, which prints alphanumerics at 12,000 lines/min, contains a forms projector that

permits business forms or other fixed data to be superimposed over computer-generated data, the company said. The standard character generator is capable of producing 128 printed characters in various fonts, sizes, and orientations.

Since the system is programmable, standard programs are available for reading most print tape formats, it was stated.

The 600 has a basic capability of plotting graphics. Software is provided to convert computer-generated data into graphs, tables, and charts, the company said.

This equipment will be on display in Booths 5910-5911.

#### Retrieval System

ROCKVILLE, Md. — A data retrieval system developed by DSI Systems, Inc., will be exhibited.



The system, called Microsearch, consists of a microfilm display screen, an alphanumeric keyboard, and a strip printer for receiving updated information, the company said.

The viewer is equipped with an acoustic coupler for connection with standard telephone lines. Requests for information are typed on the keyboard and transmitted to a central computer. Answers indicating the correct storage cassette and page or document position are displayed on a digital readout. The operator then inserts the cassette, and the system searches for and displays the proper page.

This equipment will be displayed in Booth 21003.

#### Microfilm Camera

VAN NUYS, Calif. — Terminal Data Corp. will introduce a new microfilm camera system, the DMF-2 System.

The camera produces microfilm copies of CRT presentations in linear or microfiche formats using 16mm, 35mm, or any width up to 105mm microfilm, the company said. The camera can be equipped with a standard or custom series of interchangeable program control disks for multiframing requirements.

The range in throughput varies between 5 and 15 frames/sec or approximately 4 to 12 microfiche/min, based on a 72-frame microfiche format. A microfiche is a 6 by 4-in. piece of flat film which contains up to 300 document images. A frame-by-frame 100-ft cartridge roll of microfilm may contain two or three thousand images.

# Computerpeople

Digital is the company that computerpeople built. In fourteen short but busy years we've done some pretty phenomenal growing. Along the way, we've established many engineering firsts, shattered some marketing traditions and established some revolutionary new concepts in the computer industry.

What we're doing is just a beginning. As remarkable as our accomplishments have been, the future looks even more promising, largely because of our computerpeople — people who like working in an environment which recognizes, encourages and rewards individuality.

Current openings include the following areas of Engineering, Sales, Marketing and Programming.

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For an FJCC interview in Las Vegas, call (702) 734-0667 or (702) 735-9453 on November 18, 19 or 20.

Before or after FJCC forward your resume to Mr. Mark Abbett, Digital Equipment Corporation, 154 Main Street, Maynard, Mass. 01754. Digital is an equal opportunity employer.

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# Microfilm Equipment at the FJCC

## Continuous Forms Photographed

CUPERTINO, Calif. — Computer Output Systems will demonstrate a new German product, for which it is U.S. distributor.

The Microbox Continuous-Stationary Flow-Camera - MBF 16/48E "enables rapid and economic filming of continuous EDP printout," the company said. The separate units that are normally used for this purpose, consisting of camera, processor, and inspection devices, are combined in one automatic flow-unit. One person can simultaneously film the originals, process the exposed film, and visually



Mindex/350 automatic reader.

## 95,000 Printout Lines Stored On 6-in Strip

PALO ALTO, Calif. — Microform Data Systems, Inc., will demonstrate its new Mindex system which includes the Mindex/330 manual reader and the Mindex/350 automatic reader.

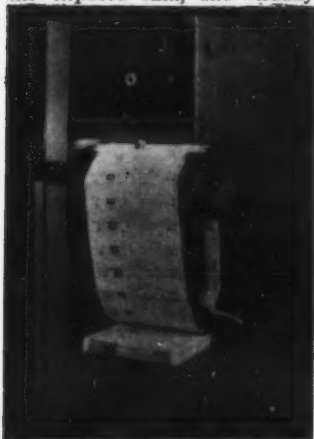
With the newest system, more than 95,000 lines of computer printout can be stored on a single 6-in. Ultrastrip which is then inserted in the manual reader, the company said. Within a few seconds the proper image

can be displayed, it said.

With the automatic reader, the proper page is accessed via a keyboard. A hard-copy print attachment is available.

The Ultrastrip is created by first converting magnetic tape to standard microfilm using a computer-output to microfilm device. Then the microfilm is further reduced by the Microform process to create the Ultrastrip.

The Mindex System will be shown in Booths 5010-5011.



inspect its quality, the company said.

Some of the advantages of the unit are listed as the ability to film large-size forms (up to 19 inches working width); the availability of finished films quite soon after exposure (the originals can be taken away at once); minimum labor cost; small working area since the unit requires a small floor area; and the capability of filming single sheets of up to 18 inches with use of an optional accessory.

## Tape Cleaner

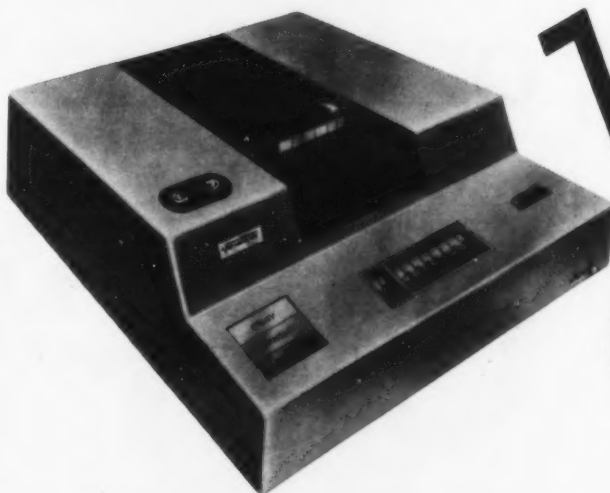
(Continued from Page 51) hibited by Recortec Inc.

The Tape Evaluator Cleaner is an off-line desk-top unit for evaluating, cleaning, and winding computer magnetic tapes. This device enables data processing installations to select error-free tapes for critical applications, to identify error-prone tapes for critical applications, to identify error-prone tapes in a library, and to evaluate new tapes before they are utilized, the firm stated.

The Compatible Tape Drive is a magnetic tape memory utilizing a vacuum chamber as storage buffer. Priced at \$3,500 in OEM quantities, the basic unit reads or writes up to 1,200 feet of 1/2-in. compatible tape, the company said.

The High Speed Tape Deck operates at a tape speed of 1,000 in./sec and has a recording density over 3,200 bits/in. This unit provides a basic design suitable for mass memory applications, the company stated, when great improvement in storage capacity, data transfer rate, and access time over current magnetic tape transports is required.

## Introducing...



**Veridata**  
TM  
**COMPLETE  
SYSTEMS  
HARDWARE**

FOR ABSOLUTE  
CONTROL OF CREDIT AND  
ACCOUNTS RECEIVABLE

**\$49<sup>00</sup>**  
Monthly  
Rental

### INSTANT CREDIT AT POINT-OF-SALE

"Veridata" is a true on-line computer concept designed to capture credit sales information at the point and time of sale and speed that data instantly to a central processing unit for immediate posting and updating of the customer's accounts receivable file.

This completely automated system, offered for the first time by Electronic Computer Systems, Inc., consists of a terminal device known as "Veridata 100", a control unit designated "Veridata 101" and all of the necessary supporting systems and software recently introduced by the company at the BEMA show in New York City.

"Veridata 100" rents for \$39.00 a month while "Veridata 101" rents for \$10.00 a month. Up to twenty terminal units will operate efficiently in line with a single control unit. Supporting systems design and software are also available on a fee basis. Either device may be purchased outright for 39 times their monthly rental.

Provided you have access to a communications oriented on-line computer, these devices are all the additional hardware necessary for the system to function properly. And to insure your success, "Veridata.100" has been designed to communicate with most major computers in use today—either in-store or over existing telephone lines to some nearby time sharing facility.

Simplicity of design and ease of operation further enhance the total system concept. To record an average transaction takes only 6 seconds. And in addition to immediate updating of charge accounts as purchases are made, the system also provides these important credit control features...

- ★ Permits the recovery of lost, stolen, delinquent or otherwise invalid credit cards
- ★ Warns of accounts with abnormally high activity
- ★ Prevents customers from exceeding their established credit limits
- ★ Provides sales persons with a daily transaction journal
- ★ Imprints sales slips with a transaction number assigned by the computer for ease in reconciling end of month statements
- ★ Permits instant display of customer receivable files for aiding management in making credit decisions

Furthermore, "Veridata" eliminates the need for floor limits, key punch machines, punch cards, verification and key punch operators while allowing for automatic hands-free, end of the month printout of customer statements. CREDIT DEPARTMENT OPERATING COSTS HAVE BEEN REDUCED BY 50% AND MORE.

While you read this message, monies being expended UN-NECESSARILY within your credit department might be EXCEEDING 40% of your ENTIRE ADVERTISING BUDGET. Just imagine those same funds being plowed back into promotion, or merchandising, or store expansion, or even back into profits. Interesting thought?

We can make it all possible! All we need is a signal from you and our team of experts will snap into high gear. Clip the coupon below and mail it together with your company letterhead to our Marketing V.P., Bill Parent. He'll see to it that you are contacted by an experienced representative right away! No obligation, of course. Address all correspondence to: Electronic Computer Systems, Inc., Dept. C10, 4471 N.W. 36th St., Miami Springs, Florida 33166, or call Area 305/885-6177.

This system is guaranteed to save you many times its cost.



WILLIAM G. PARENT, MARKETING V.P.  
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**Need  
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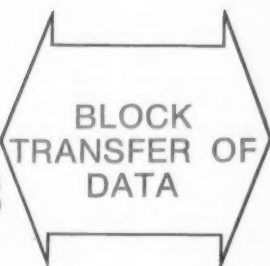


Now you big system users can get the work you need done at your *remote* locations . . . by going COPE. We're specialists in high speed data communications . . . and we've got industry's broadest line of systems to suit your exact requirements. Check the advantages that only COPE can give you:

**Total system approach.** When you rent or buy a COPE terminal system you've got just that — not a scattering of black boxes. You get a complete, fully integrated remote data communication system, including a software-compatible controller that now interfaces to such large-scale computers as the CDC 6000 and Univac 1108.

**Growth capability.** You can grow with COPE as your data communication requirements grow! Five members of the COPE family — the .30, .32, .34, .36 and .38 — can be field upgraded all the way to our new COPE .41 system (1250 LPM, 600 CPM). And the top performer in our line, the COPE .45, is software compatible with all other members of the COPE family.

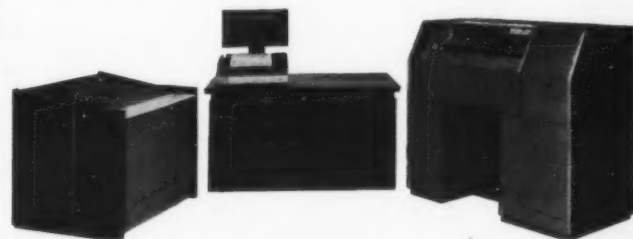
**CDC 6000  
IBM 360  
Univac 1108**



COPE .30  
COPE .32  
COPE .34  
COPE .36  
COPE .38



COPE .41



COPE .45

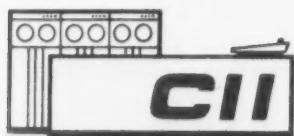
**Full-duplex, powerful high-speed through-put.** If speed is your bag, try to top the 1500 CPM and 1250 LPM provided by our proven COPE .45. And all seven of our COPEs, except for our most inexpensive dial-up terminal, the .30, operate in the COPE full-duplex mode at 4800 bps. Compare COPE specifications and you'll find our terminals give you industry's lowest through-put/cost ratios.

**Dial-up flexibility.** Four of our COPE terminal systems can access a variety of computers in the low-cost, yet versatile dial-up mode. This flexibility allows your programs or data to be sent to the computer of your choice...anywhere. In addition, these COPE terminals can operate

in both COPE full duplex and dial-up mode. COPE .30 dial up software packages simulate most popular terminal systems, including the Univac 1004 and 9300, the IBM 2780 and the Control Data user terminal.

Your money's on the line, so ride with a winner. Drop by our booth number 1107-1114 at FJCC and see our COPEs at work. While you're there, get a first-hand look at the new FASBAC system — (beyond time sharing). Can't make it this year? Then do the next best thing — call or write for complete information to: Marketing Coordinator, Data Communication Systems Division, 2659 Nova Drive, Dallas, Texas 75229, (214) 241-3501.

Terminal Type	Communications Mode		Input/Output Device Speeds (Maximum)	
	Half Duplex	Full Duplex COPE	Reader C.P.M.	Printer L.P.M.
C.30	ATT 201A/B	No	200	240
C.32	No	Yes	200	360
C.34	Option	Yes	300	360
C.36	Option	Yes	300	480
C.38	Option	Yes	600	480
C.41	Option	Yes	600	1,250
C.45	No	Yes	1,500	1,250



**COMPUTER INDUSTRIES INC**

DATA COMMUNICATION SYSTEMS DIVISION

2659 Nova Drive / Dallas, Texas 75229 / A Subsidiary of University Computing Company

# Should you rent System 21 or should you buy it?



## One of these VIATRON dealers can help you make the right choice today

Together you can pick the terms that suit your needs — out-right purchase, time payment, rental, or rental with purchase option. Your local VIATRON dealer also provides on-the-spot customer and system support — everything you need to put low-cost System 21 stations, terminals and computers to work

cutting your data processing costs.

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Birmingham, Ala. 35205  
Tel: (205) 328-8430

**Boston, Massachusetts**  
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209 W. Central St.  
Natick, Mass. 01760  
Tel: (617) 655-3576

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Tel: (312) 644-5650

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**Denver, Colorado**  
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(December, 1969)

**Detroit, Michigan**  
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Detroit, Mich. 48226  
Tel: (313) 961-6120

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Hartford, Conn. 06105  
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Tel: (904) 359-2519

**Los Angeles, California**  
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Los Angeles, Cal. 90005  
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Long Beach, Cal.  
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Programming Sciences Corp.  
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Century City, Cal. 90067  
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(215) 265-0150

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Tele-Data Systems, Inc.  
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VIATRON System 21 puts the logic where the problem is

See us at the FJCC

Additional VIATRON dealerships are being established throughout the country. For more information on the VIATRON dealer program, contact Mr. John Flynn, National Sales Manager, VIATRON Computer Systems Corporation, Dept. C-16, Route 62 Bedford, Mass. 01730



New York State Trooper radios in the license number of a car being followed. With the aid of a computer, a check on a license plate takes only three minutes.

## Dick Tracy Gadgets Now Used By Many Police Departments

PHILADELPHIA — Buck Rogers isn't the only comic strip character whose futuristic equipment has become a reality in the space age.

More and more police departments in the U.S. are now starting to rival Dick Tracy in the sophisticated devices they are using to cope with the ever-increasing crime rate.

Among several devices now being investigated for police use are:

□ A CRT unit for displaying fingerprints.

□ Patrol cars equipped with computers.

□ Computer-assisted instruction for police officers enabling

them to go to a local terminal to verify changes in rules, regulations, and laws.

□ Drivers' licenses with holes like credit cards for quick and positive identification via a terminal in the arresting officer's car.

□ Mobile sensors to read license plates.

Even without these devices, many police departments have taken giant steps forward in the last few years to employ the very latest equipment.

Probably the most important of these tools is the computer containing in its memory information on stolen cars, stolen license plates, stolen property,

missing persons, wanted fugitives, and a host of other types of data.

The speed and convenience of the computer has meant that officers following a car can now learn within two or three minutes whether the vehicle is stolen. Prior to the computer, this checking procedure could take 10 minutes, under the most favorable conditions, and often took 24 hours.

The New York State Police system is one that is typical of the application of the computer in this type of operation.

A trooper on patrol radios a suspect license number of a car

(Continued on Page 59)

### CAN YOU REALLY AFFORD TO SETTLE FOR LESS...



—than the portable  
**ADT 233**  
timesharing  
terminal?

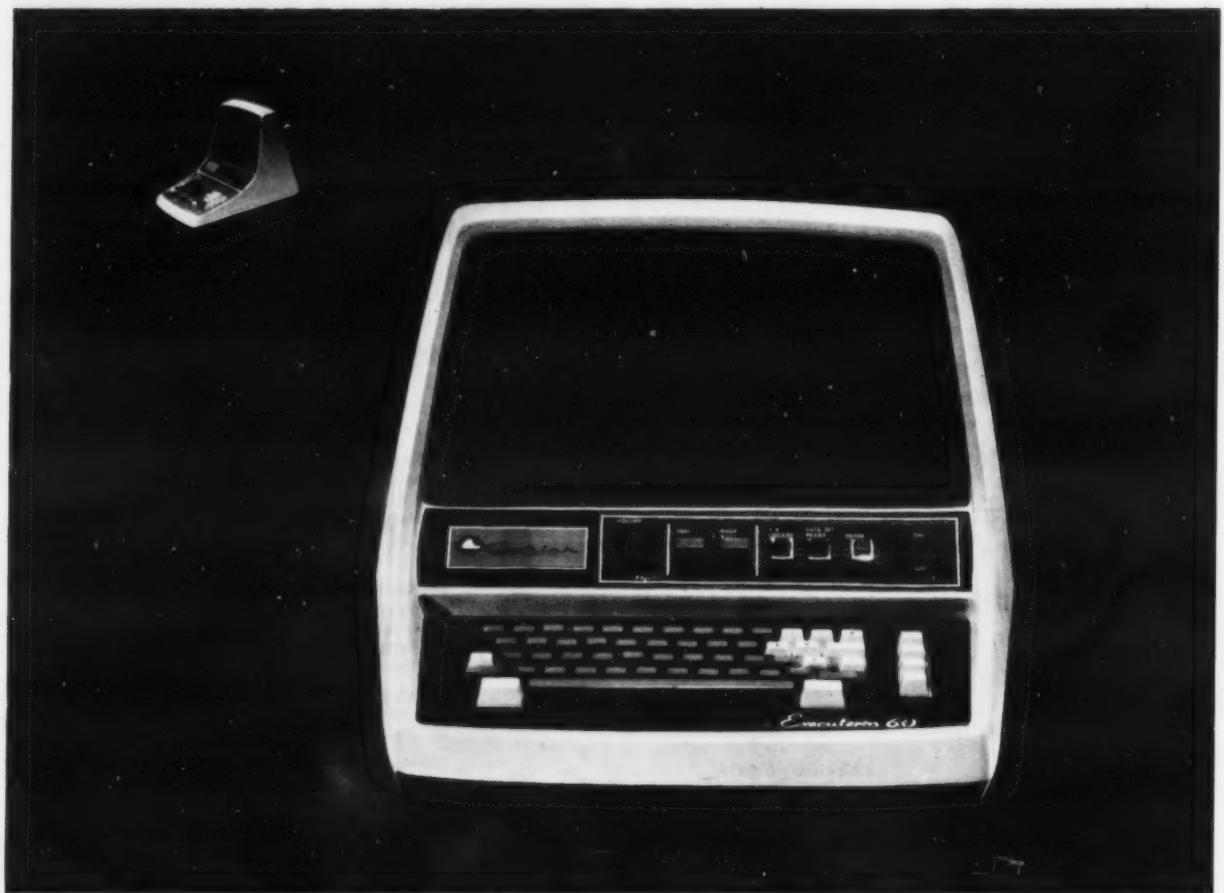
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## Courier Announces The IBM Compatible *Executerm 60* for the IBM System 360 Computer User

Does OS/DOS, BTAM, QTAM mean anything to you?

It does to Executerm 60. It understands:

1. IBM-2260 or 2265 Tele-processing
2. Line Addressing
3. Polling and Addressing
4. IBM-2260 Editing Functions

Executerm 60 is available with 240 characters (6 rows of 40 characters) or 480 characters (12 rows of 40 characters), utilizing a 7x8 Dot Matrix. Executerm 60 does not require a separate controller\* or additional software.

Courier also produces the Executerm I for the time sharing computer user. For further details on the operation, applications, and installation plans of the Executerm 60 and the Executerm I, write or call our Marketing Department.

\*for single terminal applications

See us at the Fall Joint Computer Conference, Sahara Space Center — Booth 18005 and 18006.



**Courier**  
Terminal Systems, Inc.

2202 East University Drive / Phoenix, Arizona 85034 / 602-258-7271  
NATIONWIDE INSTALLATION AND SERVICE BY RCA SERVICE CO.

## State Data Banks List Stolen Cars, Wanted Persons; Tied to FBI Center

(Continued from Page 58)

he is checking to the nearest police post. At the station the inquiry message is entered into a teletypewriter terminal and sent directly to a Univac 418 real-time computer at the State Police Communications Center in Albany. Within approximately 17 to 20 seconds, the computer searches its memory and reports whether the car is stolen.

If the car is from out-of-state, the message is automatically routed to the computer at the National Crime Information Center at the Federal Bureau of Investigation in Washington, D.C. This computer contains information on stolen vehicles, stolen property, and wanted per-

sons for 49 of the 50 states.

A teletypewriter reply message is then transmitted to the originating police post and relayed by radio to the trooper informing him if the car is a "wanted" vehicle.

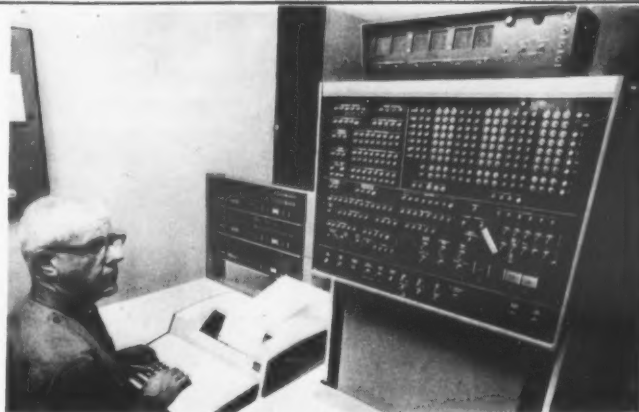
According to Deputy Superintendent for Administration John J. McGuire of the New York State Police, the primary benefit of the new system is that "you can now alert a trooper to the facts of the situation before committing him to action and additionally, you can catch the thief as well as locate a stolen car."

A total of 201 teletypewriter terminals are currently connected to the computer in

Albany. Of this total, 72 are based in state police stations, with the remainder operated by municipal police forces and sheriffs' offices throughout the state. Each month finds additional terminals being added to the network as word of the system's effectiveness spreads among the state's law enforcement officers.

Among hundreds of cases solved through the use of the computer was one recent example involving some Canadians, whose automobile was burglarized while they stopped at a restaurant at Latham near Albany.

The only personal possession of which they could give positive



New York State police officer uses computer at Albany headquarters.

identification to police was a camera, which had a registration number. The number was entered into the computer system and hence to the NCIC. Three days later the police at Yakima, Wash., reported finding

the camera among other property found in a car, whose occupants were stopped on suspicion.

Another prime application for the New York State Police computer is message switching between police posts. A message can now be transmitted from one end of the state to the other in about five minutes.

Previously, this operation had taken as long as four to 16 hours, as the message had to be manually relayed along the route. During 1968, the computer handled a total of 2,147,721 messages, representing almost a three-fold increase in the 750,000 messages processed in the year prior to the computer's installation.

Earlier this year, Minnesota inaugurated a state-wide police information system, known as Mincis (Minnesota Crime Information System), using 135 teletypewriter terminals to link the state's 87 sheriffs' offices with the central computer in St. Paul.

Harold P. Higgins, Minnesota Crime Bureau superintendent, hailed Mincis as the "greatest step forward in the history of law enforcement in Minnesota."

Donald J. Omet, sheriff of Hennepin County, which includes the state's largest city, Minneapolis, says that Mincis is "one of the bread and butter tools of modern law enforcement."

"We have to have these scientific and technological tools to keep up with the sophisticated, fast-moving criminal, when he crosses the imaginary lines that we call villages, cities, counties, and states," Omet noted.

Louisiana is another state which has found the impact of real-time computers a tremendous advantage to law enforcement.

General Thomas D. Burbank, director of the Louisiana Department of Public Safety, feels the efficiency of electronic data processing in police work has far-reaching benefits.

"Suppose," Burbank says, "there's a bank robbery in any Louisiana city. Until now, the local authorities probably would put out a call for road blocks in the direction they thought the robber was headed. Later as they had time, they would inform other people. With our computer system, the same officers will need to file only one message. It will come to our computer, which, assigning it top priority, will immediately broadcast the alarm to all points."

Eventually the officer on the beat may be using such terms as "input" and "interface" as readily as he now talks about "stake-outs" and "all-points bulletins."



## Courier announces Executerm I

Designed for the Time Sharing Computer User

Here is the data entry and retrieval terminal designed and engineered specifically for the needs of the time sharing computer user. In addition to being fully teletype compatible, the Executerm I offers the following exclusive features:

1. Variable Split Screen
2. Non-Destructive Cursor
3. Conversation or Edit Mode
4. Page Roll

And the cost is amazingly low.

For further details on the operation, applications, and installation plans of the Executerm I write or call our Marketing Department.



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**Courier**  
Terminal Systems, Inc.

2202 E. University Drive / Phoenix, Arizona 85034 / 602-258-7271

# Why would any self-respecting computer manufacturer enter the crowded keyboard data entry market?

There are already 20 companies offering keyboard data entry systems. Most of these companies are new and small. None manufacture the computers they sell. The market is crowded. The competition is fierce. So who needs it?

## Introducing KeyTran.

We're offering our own computer-based keyboard data entry system because it's different. More important, because it's better.

KeyTran can handle variable record lengths up to 399 characters. It collects, searches, edits, formats, analyzes, verifies and corrects data automatically from up to 48 terminals simultaneously. Stores it on disk or tape. Then prepares it for your central computer. All at huge savings over keypunch-verifier systems and key-to-tape systems.

That means you don't have to worry about whether it can handle all your data entry requirements.

## Our own computer.

KeyTran is controlled by a



The new KeyTran system will be demonstrated for the first time at the Fall Joint Computer Conference. See it at booth 2900.

### SYSTEMS Engineering Laboratories

6901 West Sunrise Boulevard  
Fort Lauderdale, Florida 33313

Please send me more information about KeyTran.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

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750-nanosecond SYSTEMS 810B computer. It was designed for high reliability in real-time applications, and it comes with complete system and application software.

We make it ourselves. So we pay less for it. And you pay less for it.

## Service when you need it.

We manufacture and test the entire KeyTran package. Which means your system is supported by a national engineering, service and maintenance organization that's already established, trained and in place in every major city.

So you don't have to depend on an overloaded service engineer somewhere in the next state. Or, worse, help us pay for setting up a new company across the country.

## Now you know.

That's why we're introducing KeyTran. Better performance. Better service. Better price.

There's always room at the top.

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Address		Marital Status	
City	State	Zip	No. of Dependents
Home Phone		Business Phone	
Position Wanted		Draft Status	
Industry Pref.		Present Salary	Required Salary
		7- 9K	7- 9K
Geographical Pref.		9-11K	9-11K
		11-13K	11-13K
Education:		13-15K	13-15K
		15-20K	15-20K
high school	college (partial)	over 20K	over 20K
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## 30,000 Newsboys Create Paperwork Problem, So 'Grit' Computerizes

DAYTON, Ohio — *Grit*, a national newspaper, has computerized a large proportion of its operations and added paperwork efficiency to many areas.

One new system, designed specially for *Grit*, enables it to handle circulation more effectively while keeping pace with modern developments in information and communications.

Published weekly, *Grit* is mailed to 220,000 subscribers and sold to one million others by more than 30,000 local sales boys.

The operation requires numerous reports, order forms, labels and bills. *Grit's* management decided to install a computer to deal with the paperwork and circulation problems.

"With the decision to bring in a computer came the problems of devising new systems and forms with which to implement them. For this task we called on the Standard Register Co. to redesign old forms and design new ones," reports Paul E. Fink, *Grit's* circulation director.

Circulation, which involves 52 to 78 transactions a year, was the first area to undergo computerization.

"We anticipate that the computer and the new forms will give us greater speed, accuracy, and efficiency," remarked Fink.

All information is now kept in magnetic tape files, he said. Whenever information is wanted or a transaction is to occur, a tabulating card is punched for a computer request, he said.

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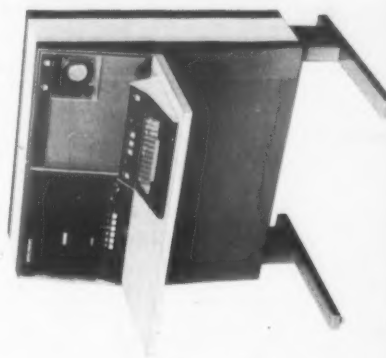
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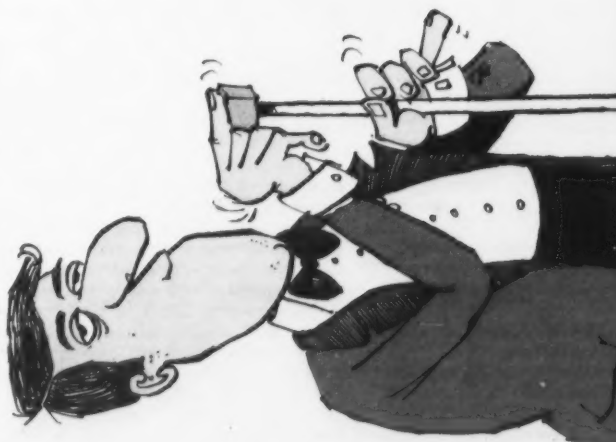
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## Trucking Company Installs CRTs To Replace Keypunch Units

LA CROSSE, Wis. — Gateway Transportation Co., Inc., has added eight visual display terminals to its electronic data processing installation, replacing keypunch operation for most functions.

EDP manager Phil Larson, who announced the conversion from batch processing to multibatching, believes Gateway has one of the first such systems in the transportation industry. The new input system reduces by as much as three days the time required to prepare and distribute data to the computer for processing, he said.

"Permitting the computer to store data simultaneously with other tasks brings it closer to its information-receiving capacity," noted Larson. "The same opera-

tors are handling data preparation under both systems, and those using the new IBM 2260 terminals like them better, because they are quieter and eliminate handling of cards."

Gateway, the nation's eighth largest common carrier, utilizes its IBM 360/30 for billing, payroll, sales inventory, and parts inventory for in-house repairs on its vehicles. Extension of EDP services to operational functions is currently under study.

Instead of punching data into cards, which must then be processed in batches through a card reader into the computer, data is introduced directly from keyboard to computer. The computer's information-receiving capacity is far greater than the fastest card reader.



Nancy Taylor, a keypunch operator for Gateway Transportation Co., Inc., operates one of their new IBM 2260 display stations.

## Fire Prevention System Designed For Airplanes

LOS ANGELES — Computer modeling helped develop a new technique to protect airplanes from fuel tank explosion and fire.

The process uses nitrogen, an inert, noncombustible gas, to reduce the level of oxygen normally present in a fuel tank's vapor space.

Parker Hannifin Corp. engineers conducted the first "flight tests" inside an IBM 1130 before the prototype was ever built or a test plane ever left the runway.

"The computer told us exactly what we needed to know without our having to build any experimental hardware," said Tolman Geffs, program marketing manager for the new system. "When we built a prototype, it worked perfectly the first time it was tested."

The new technique, based on cryogenics (the use of very low temperatures), is now being flight-tested by the Air Force and is being studied by the Federal Aviation Administration.

"Oxygen in the tank's vapor space is only part of the problem, because any liquid tends to absorb oxygen from the air, then release it when the pressure lowers," Geffs explained.

"It's something like the carbon dioxide gas in a bottle of soda pop. When the cap is on, the pressure is retained and the gas stays dissolved. But once you open the bottle, the pressure is released and the gas wants to come out. Shake the bottle, and it all wants to spew out at once."

The same thing happens in an airplane fuel tank, he said. At sea level the pressure is comparatively high, so the oxygen dissolves into the fuel. However, it evaporates when the plane reaches higher altitudes, creating a combustion hazard in the vapor space above the fuel.

Parker Hannifin's inerting system prevents this by saturating the fuel with tiny nitrogen bubbles that displace the oxygen in solution. The exact size of the bubbles, the rate at which they are injected, and the rate at which nitrogen displaces free oxygen in the tank at all altitudes, were critical factors in the design.

The optimum design was developed by using a mathematical model of a fuel tank installation. Various design concepts of the inerting system, and data on the known chemical characteristics of the fuel and the two gases involved, and how they interact when subjected to variations in temperature and pressure were input to the computer.

The flight of an airliner was then simulated by feeding the computer such data as the rate of ascent or descent during take-off and landing and altitudes during the flight with their equivalent atmospheric pressures.

By means of an automatic plotting device, the computer responded by drawing graphs that showed how the inerting system performed during the many different simulated flights.



Introducing the Motorola MDP-1000, the remarkable 8-bit computer with shared-byte power.

Eight-bit minis are great real-time communicators and data handlers. But almost all of them squander memory capacity via two-word instructions.

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This gives you more core power. More capacity for the tasks to be done.

The MDP-1000 has a 4K memory, expandable to 16K in 4K increments. Its tall, slim package fits in a relay rack or a shallow wall cabinet. You can install it anywhere.

And we do mean anywhere. This rugged little machine is at home in the most extreme

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## Accurate Data Allows 25% Inventory Cut

LINCOLN, Neb. — Hy-Gain Electronics Corp., which makes antennas for amateur, citizen's band, commercial, military and scientific purposes, uses a computer to control labor and material scheduling and monitor work flow.

Terry L. Jones, vice president of operations, said the computer-based production system smooths the manufacturing process and cuts the costs of inventory storage.

"For the first time, facts are replacing estimates of production costs and we know the true turnover speed of our inventory," he said. "This means more accurate pricing and lower stock-on-hand costs.

"Although the system has been in operation only a short while, we already can see indications of substantial improvements in many areas of our business," he said.

Guided by a new labor and material planning (Lamp) program, the IBM 360/20 aids management by:

- Maintaining current inventory records and use history on 10,000 antenna assembly parts.

- Scheduling parts from inventory to the production line when and where they are needed.

- Allocating jobs to workers and machines.

- Aiding evaluation of proposed engineering changes.

The computer's magnetic disk files include all information associated with where and when each inventory part is used. This aids Hy-Gain officials in learning the actual use of each part and minimizes the time in storage before a part is used.

With information now available, Jones said, the company should be able to reduce its \$1.5-million inventory by one-fourth before the end of the year.

In addition to storing historical inventory and use data, the computer also reports the assembly steps used in producing each of the over 300 types of antenna sold. Jones said there are 27,000 possible combinations of parts and nearly 27,000 work steps involved.

"We can determine the exact location of any project at any time with the data collection system," said Jones. "This means improved production control and job scheduling while we gather information on exact costs for each step of each customer project."

Another phase of the same program assigns jobs to each work station, avoiding both idle time and large backlogs. Jones said this means a 10% increase in Hy-Gain's production capacity.

In addition, since the computer can list every use of every part, engineers can spot ways to standardize assembly parts. Jones said this could result in a reduced inventory as well as simplified production process.

Engineers also are able to evaluate the proposed design modifications by reviewing the total effect of any change.



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Hix H. Green Jr., president of Hix Green Buick, and his father look over a computer printout of details on auto sales.

## Computer Keeps Track of Car Sales, 20,000 Auto Parts, Service Records

ATLANTA — A computer is helping Hix Green Buick Co. keep track of paperwork and customers involved in transactions on more than 4,800 new and used autos a year.

"The computer generates information which helps us make decisions and take actions to assure that we have a sound and well-balanced business," said Hix H. Green Jr., company president. "The result is less paperwork, better customer relations, and closer control over our profits and losses."

Green said the computer also has made it easier for management to keep pace with the company, which he said has had a sales volume increase of 60%

over the past two years.

Hix Green also uses its IBM 1130 computing system to improve service to customers by maintaining an inventory control on some 20,000 different types of auto parts, keeping records on all auto servicing, and forecasting marketing trends.

"We have enough reports coming from the computer so that we are able to pin down and analyze any trouble spots and correct them," Green said.

William Dunwoody, secretary-treasurer, said more than 90 different programs are being used to produce a complete general ledger accounting system with 12 journals and supporting schedules.

One of the most important programs generates a financial statement run at the end of each business day. This is known as the auto dealers' Daily Operating Control.

Green said the information generated by the 1130 enables the management to spot trends on such things as the amount of service performed, and whether the service was on external sales or manufacturer's warranty. A record also is kept on the exact number of claims, parts used, labor charges, and service orders written for customers on a daily, monthly, and year-to-date basis.

Under programs for parts inventory control, the computer is fed information on parts used from tickets written when an auto is repaired or serviced. Parts used are automatically removed from inventory by the computer, which then prints orders for replacements each week to keep the supply constant.

The computer also keeps track of parts by their frequency of use and prints lists of those considered obsolete.

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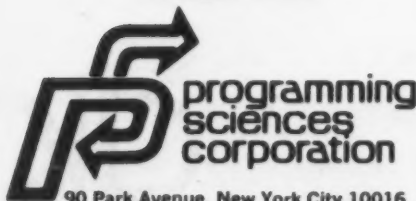
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## Small Machine Does Physics Calculations

LOWELL, Mass. — Using a relatively small computer to do a job normally requiring a large data processing system has been considered an impossible task by most data processing people, but the nuclear center laboratory at Lowell Technological Institute is doing just that.

Faced with the unavailability of a larger computer on campus, Dr. Suresh C. Mathur, Donald R. Donati, and Richard Hully have developed a way of using their small data acquisition computer, a Digital Equipment Corp. PDP-9 to perform complex nuclear analyses.

The nuclear center personnel had to devise a way of adapting large analytical nuclear structure programs to their 16K core memory PDP-9. By using the mass storage capacity of the computer, they developed a program technique that allows the PDP-9 to use only a portion of the total program at a time, while the bulk remains in mass storage. Effectively, they are now able to do calculations on the small computer that were originally developed for large systems with core memories in the range of 32-128K.

"The use of the PDP-9 for this application is totally unique," says Mathur. "In fact, what we're doing was first thought to be impossible, but there is a lot you can do with a small computer if you put your mind to it."

Three nuclear structure programs originally written for large computers are now being used with the PDP-9. The results of one of their investigations in inelastic nucleon scattering, in which analyses were performed with the PDP-9 computer, have been reported at the recent American Physical Society Meetings.

# Introducing the goof-proof encoder.

The revolutionary Model 75 is so simple to use that an operator can be fully trained in just a day; so goof-proof that errors are almost a thing of the past and so electronically perfect (due to solid state integrated circuitry) that costly downtime and repairs have virtually been eliminated . . . there's only one moving part!



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*\*The Model 300 can produce  
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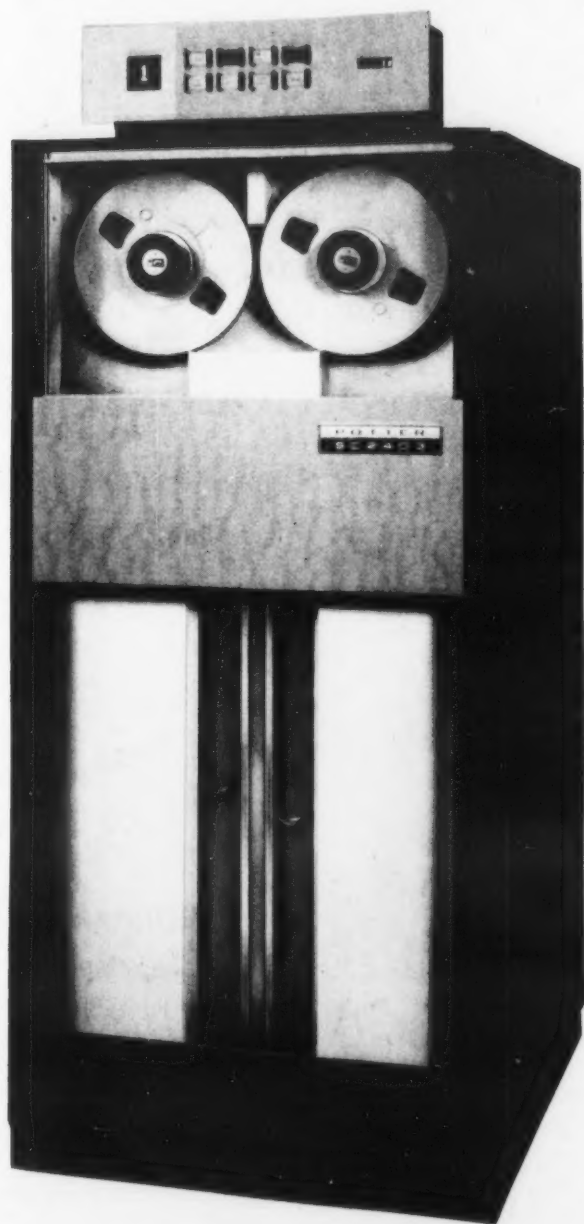


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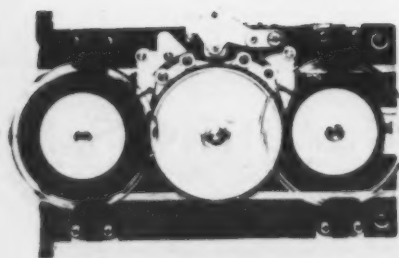
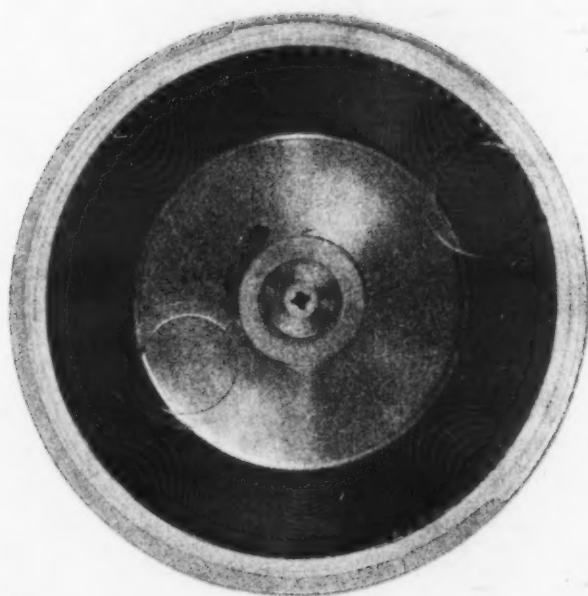
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And through data sets? b)	✓	—	—	—	c) Software	✓	—	—	—
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# Computer Indexes Travel Guide, Then Sets the Type

NEW YORK — What has been billed as "the most comprehensive travel-tour guidebook ever scheduled for publication" has entered the production cycle, with the first pages going to a computer for processing prior to being set in type by electronic photocomposition.

The work is being performed by Videographic Systems, Inc., in behalf of the Newspaper Enterprise Association, publishers of *The World Travel and Vacation Almanac*.

The editorial material and tour listing sections of the almanac are being produced by Travel Books, Inc., under the supervision of the NEA publications division.

The 400-page almanac is to detail every international packaged tour departing from major North American gateway cities and all U.S. domestic tours. The volume will provide information concerning departure date, duration, price, means of transportation, and countries and cities to be visited.

An initial press run of 600,000 copies of the 8-1/2-in. x 11-in. paperback volume will go on sale for \$1.95 early in 1970 through some 150 major American newspapers and 50,000 U.S. newsstands and bookstores.

A master data bank currently being developed by Videographic Systems will permit resequencing of all almanac listings to produce indexed sections individually grouping the tours by categories of special reader in-

terest — departure dates, duration, price ranges, cities involved, and sponsoring agencies. The data bank will also facilitate production of future issues of the annual publication.

The computerization and type-setting functions are being performed at Videographic Systems' Hauppauge, L.I., plant.

The complex of technical equipment available for use in preparing *The World Travel and Vacation Almanac* for publication includes two RCA Spectra 70 systems, two RCA Videocomp photocompositors, and 25 perforating machines.

The almanac's manuscript is first put on punched paper tape and then fed into one of the computers, which converts the paper tape to magnetic tape and



NEA's *World Travel and Vacation Almanac* is being prepared in this computer center at Hauppauge, N.Y.

automatically hyphenates and justifies the complete text. The computer also adds detailed instructions concerning the type sizes and styles to be employed throughout and the format to be followed.

The computer then passes the tape on to one of the electronic photocompositors, where the following processes occur in succession:

□ The tape is read at speeds up to 30,000 char/sec.

□ The tape is sent through a control core section, in which type characters (each translated into a series of dot segments) are extracted from storage to match the computer's instructions.

□ The resulting characters are flashed on the face of a high-resolution CRT and precision-photographed at speeds up to 6,000 char/sec, almost 500 times the conventional typesetting production rate.

□ The sensitized paper on which the continuous photographs are taken is automatically developed, fixed, dried, and sheeted.

□ The stabilization paper, representing finished proofs, is deposited in an external receiving basket at the rate of 10 ft/min.

## Data Bank Lists Air Cargo Rates

NEW YORK — The first commercially available data bank of international air fares and cargo rates has been announced by Dataplan, owned jointly by Informatics Inc. of Sherman Oaks, Calif., and The Interpublic Group of Companies.

According to Michael Freccia, tariff specialist for Dataplan, the data bank contains up-to-date fares and rates for 200,000 pairs of connecting points and includes all variations in fares and rates that apply.

Primary users of the data bank, Freccia says, are airlines and freight-forwarders. Currently, TWA is using the data bank in the preparation of its Cargo Memo Tariff, and Emery Air Freight is using the data bank for its World Wide Cargo Memorandum Tariff, he said.

Freccia explained that cargo rates and passenger fares are determined biennially by IATA (International Air Transport Association), with changes made by mail vote of the membership on the average of once a week. All updated IATA rates and fares are stored by Dataplan on magnetic tape and processed by an IBM 360/40 computer.

The computer he said, is capable of creating custom tariffs for an airline according to the cities and connecting points served. For freight-forwarders, the computer can develop specialized rate structures based on served and commodities handled, with considerable time-savings, he said.

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The service has been successfully used by major insurance companies, banks, brokerage firms, manufacturing companies, and major service bureaus throughout the United States.

Satisfied users include Firemen's Fund Insurance Co., Crown Central Petroleum, FMC Corporation, Connecticut Savings Bank, James Talcott, Inc., Dominick-Dominick, Tracor Computer Corporation, and the largest service bureau corporation in the United States, among others.

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# Is an Airplane Healthy When Its Nose Is Cold?

COLD LAKE, Alberta, Can. — The Canadian Air Force is installing a \$3.5 million computerized system at its Primrose Lake Evaluation Range, near here, that can track a plane and tell what the temperature is on the nose or the structural stress on either wing while the craft is in flight.

The system, called Pler after its location, functions by recording signals from sensing devices on the aircraft through the use of ground radar units. These signals are recorded in analog fashion, then converted into digital computer language for a Honeywell Model 516 computer to gather and analyze data and project the results on a circular 30-in. plotting board. The data is retained for record or recall upon magnetic tape.

The system was designed by the Reeves Instrument division of Dynamics Corp. of America.

Initial applications by the Canadian Forces' 448th Test Squadron based here will include test programs for ground weapons delivery systems and pilot training in bombing techniques. It is believed the CF-5 fighter will be used extensively in the testing, as soon as the system is delivered this month.



Program for Canadian Air Force system is loaded into paper tape reader.

## Says Computer Is Like Dishwasher

SILVER SPRING, Md. — "A time-sharing computer terminal is to the engineer what an automatic dishwasher is to the housewife," said Arthur Begelson, partner in Shefferman & Bigelson, consulting and mechanical engineers here. "It enables him to do better and faster by machine what he used to do by hand."

"And, like a dishwasher," adds partner S.M. Shefferman, "the convenience of today is the necessity of tomorrow. In five years, I don't believe any of us will be able to compete effectively without some form of computer assistance."

Shefferman sees the time-sharing computer playing an increasingly important role in the day-to-day operations of the firm. He sees a growing critical shortage of qualified engineers, and believes that the best way to relieve that shortage is to extend each engineer's capability with a "personal computer."

According to Harvey Fried, program manager at Reeves, the system is a technical update of a similar system installed for the Federal Aviation Administration in Atlantic City, N.J., about five years ago.

One of the major differences, he said, is the nature and extent of software developed for the Canadian system. Four off-line programs — one for data searching and three others for telemetry, radar, and phototeodolite reduction — were specially prepared for the Canadian system, he said.

Phototeodolites are optical tracking devices that measure horizontal and vertical angles or azimuth and elevation distances from the ground.

The data search program lo-

cates information stored in the computer's 16,000-character memory and prints it on a Teletype. Reference data is recorded by time or measurement and is taken from magnetic tape files.

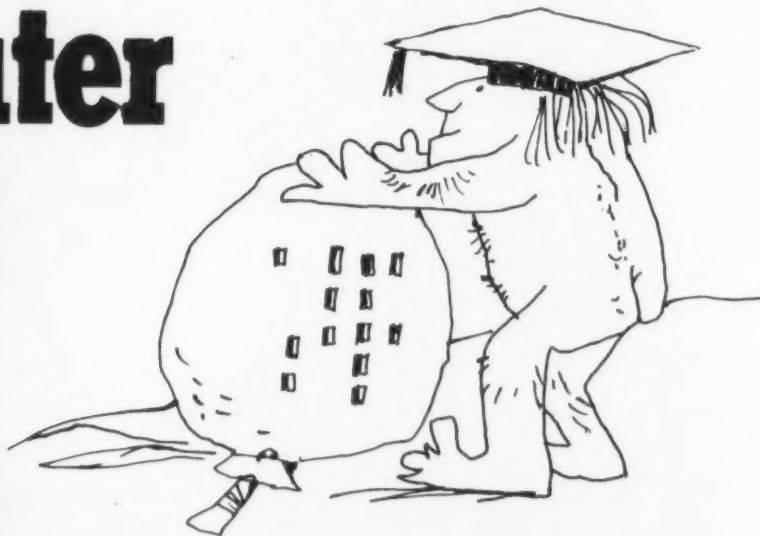
The telemetry program consists of conversion tables that transform data such as temperature, pressure, intensity, or speed of the aircraft into computer format. The radar program functions by using the Cartesian method, where the distance of one or two aircraft is measured by intersecting transmission waves from two radars.

This radar data is processed concurrently by the computer, which can then calculate range information, print on the Teletype, and display the real-time position on two plotting boards.



Technician adjusts precision tracking dish used by Canadian Air Force.

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# Computers Test Pollution Effects of Auto Exhausts

## Even Rolls Royce Foul the Air

LONDON — Rolls Royce, Ltd. recently became the second British auto maker to incorporate a small general purpose computer in an automated system for analyzing exhaust gases from autos being exported to the U.S. Earlier, Standard Triumph Motors began using a similar system.

The Rolls Royce system uses a Digital PDP-8/S linked via a device designed and built by the company's Electronic Department at Crewe, England, to a special analyzer. It is programmed to monitor exhaust gas concentrations produced in vari-

ous driving conditions, such as idle, acceleration, cruising, and braking. The basic test determines the hydrocarbon and carbon monoxide concentration for an average trip of about 17 minutes in a metropolitan area, from a cold start.

The test facility at Crewe was built to enable Rolls Royce autos to be tested for compliance with American standards for the control of air pollution in motor vehicles. The computer monitors gas concentrations from each analyzer at the rate of 10 samples a second, determines average values for each mode, performs the necessary calculations, and prints out the results, stage by stage, during the test.

Standard Triumph's system was built by Systems Computers and Grubb Parsons, both mem-



Accurate on-line exhaust emission monitoring is provided by this Applied Dynamics K-400 data acquisition reduction system.

bers of the Reyrolle Parsons Group, and incorporates a PDP-8/L computer.

## To Implement Federal Rules

ANN ARBOR, Mich. — The National Air Pollution Control Administration has a method which it hopes will provide a reliable means of implementing the requirements of the federal government's 1970 air pollution test standards for new motor vehicles.

The agency is using three computer systems designed for efficient, economical, and accurate on-line exhaust emission monitoring to determine the pollution effects of automobile exhaust gases.

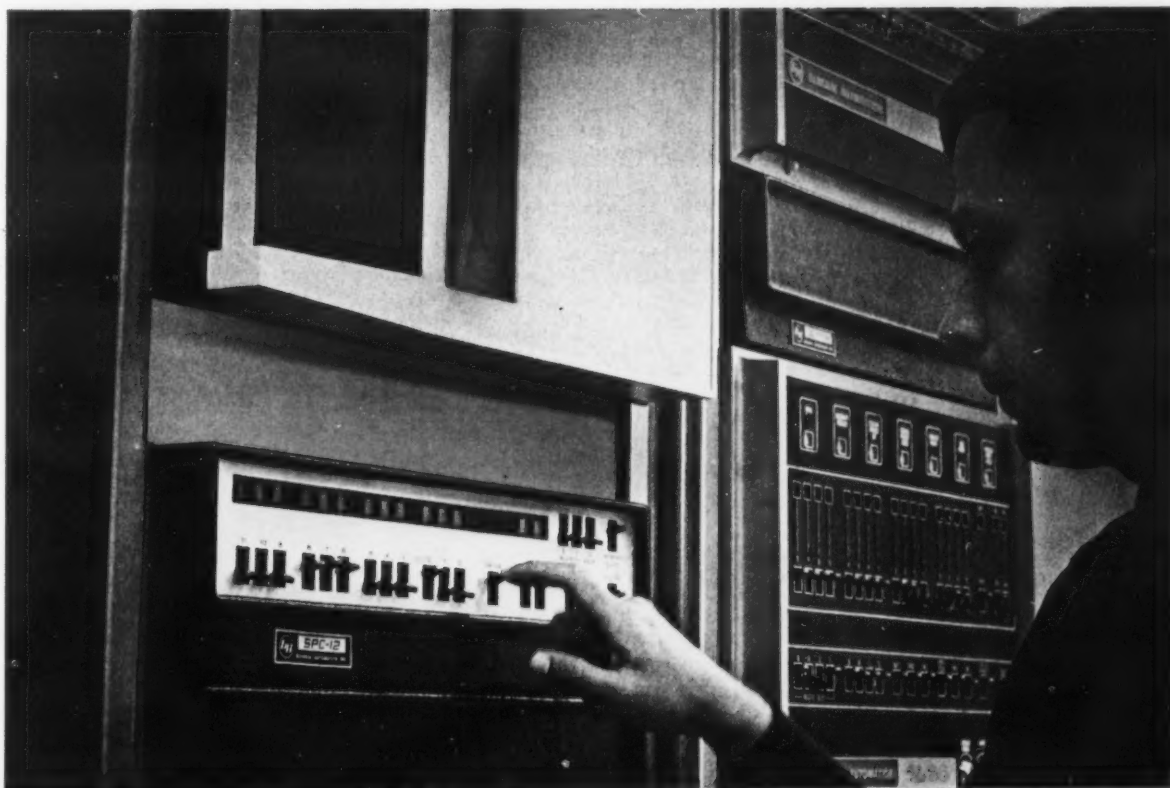
Two Applied Dynamics' K-400 data acquisition/reduction sys-

tems, using Digital Equipment Corp. PDP-8/L computers, have been installed at the Air Pollution Control Administration's Motor Vehicle Control Program Center at Willow Run Airport in Ypsilanti. The third system is in use at the Motor Vehicle Control Program's field laboratory in Los Angeles.

Accepting data from two sample train stations on an alternating basis, the system conditions gas analyzer input signals from the test vehicles, and linearizes and integrates the data over variable time periods using both analog and digital circuitry.

The PDP-8/L takes this data and performs arithmetical functions and formatting to provide a printout in accordance with the specifications in the 1970 federal standards.

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# Satellites Determine Position of Ships, Planes

SCHENECTADY, N.Y. — A method for determining the positions of ships, airplanes, and land vehicles through the use of communications satellites was tested in a series of experiments conducted earlier this year by the General Electric Research and Development Center under a contract with the National Aeronautics and Space Administration.

The experiments were designed to permit a ground-based station to locate automatically — via satellite link — aircraft, ships, and land vehicles equipped with automatic receiving and transmitting equipment. Results of the tests may lead to application of

advanced techniques for satellite position-fixing and traffic control that could aid in the solution of the world's transportation problems.

Key components in the tests were two Nasa Applications Technology Satellites now in orbit, the ATS-I and ATS-III, and a time-sharing computer. The satellites relayed coded signals back and forth between the tracking station and participating vehicles. The time-sharing computer analyzed the signals and calculated the position of a vehicle in only a few seconds.

Precision of better than three to five nautical miles was achieved, equalling the performance of

the best currently available navigational aids not using satellites. At the same time, the new system offers the advantage of covering very large areas of the globe, and "reporting" to a ground control station, rather than merely informing the vehicle's crew of where they are, or covering only a limited area, like an individual ground radar station.

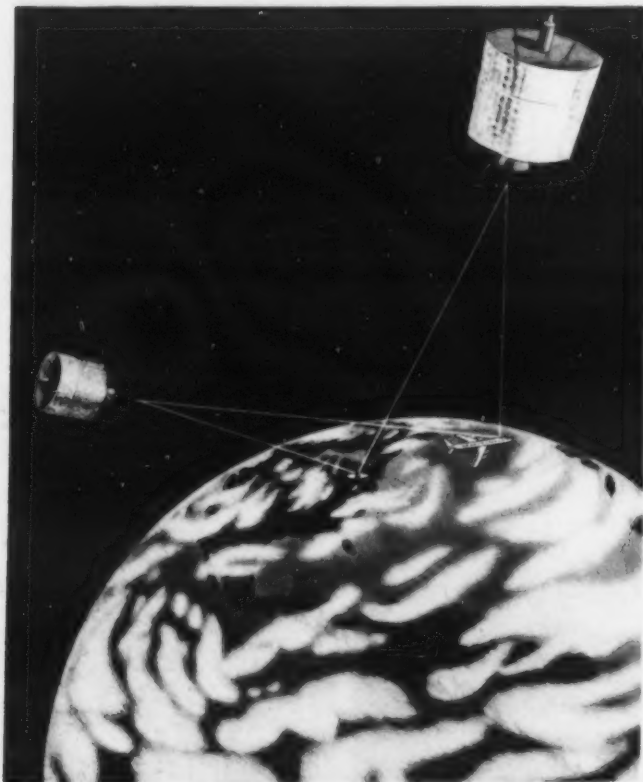
The experiment — developed by Roy E. Anderson, a consulting engineer at GE's Research and Development Center in Schenectady — made use of very high frequency (VHF) transmitting and receiving equipment carried by ships and aircraft. This equipment linked participating vehicles through the two Nasa satellites to a ground terminal. Signals were analyzed at General Electric's radio-optical observatory near Schenectady.

In the tests, a ground station transmitted a coded signal to the ATS-III. The satellite retransmitted the message to all participating vehicles. The single vehicle identified by the code in a given test automatically transmitted a coded reply back to both satellites, which in turn relayed the reply back to the ground station. Measurement of the time for the signal to go from the satellite to the vehicle and back through each of the two satellites permitted the ground station to calculate the vehicle's distance from the two satellites, the positions of which were known accurately.

GE provided VHF equipment for a mobile van, which roved the Schenectady area; for a Coast Guard ship in the Gulf of Mexico off Galveston, Texas; and for two Federal Aviation Administration aircraft, one a propeller-driven DC-6 over the Atlantic Ocean near New Jersey and over the Midwest, and the



Roy E. Anderson, General Electric consulting engineer, uses remote terminal that analyzes data relayed via satellite.



Artist's conception of new navigation and traffic-control system.

## Puppies Deprived of Social Contact With Each Other in Isolation Study

BAR HARBOR, Me. — Isolation of the young during an early stage of their development, a common occurrence among disadvantaged children, may cause serious but not irreparable mental and social deficiencies, according to a scientist here.

Dr. John L. Fuller, associate director of the Jackson Laboratory and behavior geneticist, is investigating the effects of cultural isolation on the young with the aid of young puppies and a computer.

As part of a six-year study of cultural deprivation, Fuller has worked with 150 puppies which were placed in complete or partial isolation for varying periods. Fuller believes puppies and young children react to isolation in strikingly similar ways.

"Depriving puppies of social contact with each other, or with humans, was begun as a study of the persistent effects of modifying early experience," he explains.

In one experiment, 3-week-old puppies were removed from

their mothers and placed in small but comfortable cages without physical or visual contact with humans.

The puppies were observed at regular intervals and their behavior recorded using a specially devised alphabetical code. This code was then translated into digital language so the laboratory's IBM 1130 could assign numerical values to the puppies' behavior.

Fuller discovered that isolation caused some dogs to develop an "irrational fear" of space and new environments. Such fears were not noticed in normally reared puppies because their introduction to a new environment was usually gradual. This gradualism allowed their senses to adapt and cushioned the shock of emergence.

When applied to socially deprived children, Fuller's theory of "emergency-stress" may be of particular importance to those working with unstimulated youngsters reared in "dull environments."

Fuller also found that isolation doesn't always impair the learn-

ing processes. A few of his puppies kept in isolation even emerged from the tests essentially unscathed by being deprived of contact with other dogs or humans.

If children respond to isolation as puppies do — a big assumption, but not entirely far-fetched — one could conclude that:

□ Although the effects of social deprivation are very severe, they can be counteracted by relatively brief breaks in isolation. This means that persons who leave their children alone in an apartment can counteract the effects of isolation by intense socializing upon their return.

□ It is important for a child's development to have regular social contacts and to make these contacts as intensely gratifying as possible.

□ Finally, cultural isolation doesn't necessarily interfere with a child's capacity to learn. What does interfere with learning is an "over-reaction" to failure. Some isolated children are extremely disturbed by not succeeding and so withdraw from all effort.

other a large jet, a KC-135, over the North Atlantic near Iceland. Also a part of the test, in cooperation with the Office of Naval Research, was a Sea Robin oceanographic buoy, designed and built by Ocean Systems Programs of GE's Re-entry and Environmental Systems Division. The buoy, designed to gather and transmit data on ocean conditions by radio, was moored off Bermuda.

Anderson stated that the equipment required for such a system would consist of several simple, low-cost, solid-state circuits which would be added to a vehicle's receiver and transmitter. The satellites require no modifications or additional equipment.

Voice communication, as well as the coded ranging signals, was transmitted on the same channel during the tests. The compatibility of voice communication and position surveillance, Anderson said, is an advantage which would ease the problem of adding the traffic-control capability to existing aircraft equipment.

The experiment examined susceptibility of VHF frequencies to "multi-path," a problem encountered by aircraft flying over water in which echo-like signals reflected from the surface of the water are received by the aircraft in addition to directly transmitted signals. Problems involving the interaction of VHF signals with the ionosphere also were studied. These effects would be less severe, Anderson pointed out, if higher frequencies could be used. Aircraft today, however, are not equipped to handle frequencies higher than VHF, he said.

Success of the initial experiments suggests that an operational VHF satellite system would permit reduction in the distance between aircraft flying transatlantic routes, permitting an increase in the number of

aircraft flying those routes while maintaining the present high level of safety.

Such a traffic control system also could increase marine safety, particularly in areas near the entrances to seaports and reduce the incidence of ship collisions and groundings. In addition, the shipping and fishing industries might benefit from increased efficiencies that could result from more precise position fixing.

Other applications of the system might include the gathering of oceanographic and meteorological data from unattended, remote sensors (like the Sea Robin buoy) and the tracking of dangerous icebergs.

According to Anderson, the need for such a system becomes increasingly evident as airlines establish more transoceanic flights and as shipping delays become more costly. "The satellite position-fixing technique is a practical application of space technology which cannot be accomplished economically by any other method," he said.

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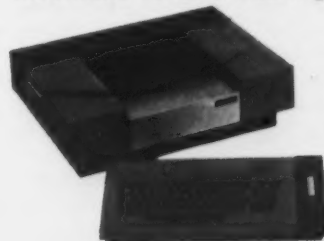
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Store clerk processes Standard Register Zipcard.

## 'Zipcard' Simplifies Paperwork For Ladies' Store Lay-Away Sales

KANSAS CITY, Mo. — Paperwork for lay-away sales has been simplified and is being controlled by a combination of data collection equipment and specially designed business forms at Adler's, a ladies' and children's specialty store here.

Both the data collection equipment, a source record punch, and two Zipcard (tabulating card unit set) forms are products of the Standard Register Co.

According to Adler Vice-President Tom Berry, store management has better control through improved audit trail documents, and store personnel find the new system to be simple and accurate. The use of preprinted and prepunched consecutive numbers in both forms, Berry said, makes errors and account status checking easy.

A sales clerk writes up the sale on a three-part Zipcard form, a sales ticket including such information as customer name and address, phone number, item

purchased, manufacturing and style numbers, color code, date, amount involved, and clerk number. After the customer signs, she receives the middle copy as a receipt.

The last copy, a tabulating card, is attached to the garment while the original copy, also a tab card, is audited and sent to the data processing department. There the amount of sale, balance due, payment code, and customer name are keypunched into it. Cards are processed for a daily listing of sales and then sent to the lay-away desk for future use as master cards.

A source record punch is located at the lay-away desk along with three-part Zipcard receipt forms. When a customer makes a payment, the clerk uses the machine to put information into the Zipcard form in both printed language and Hollerith code. Information comes from the master card, internal machine slide settings, and a keyboard.

The customer gets the original paper copy of the receipt and the second copy goes to the sales audit department after a daily balance has been prepared. The tab card copy is filed with the master card. Once a month the data processing department uses the cards to combine information with other data for various analyses, balances, reports, and so on. After final payment, the card copy that had been attached to the garment is removed and filed.

Adler's averages about 1,000 lay-away payments each month.

## Computer Makes Sure Right Size Nuts Are Delivered

SACRAMENTO, Calif. — Food processors may not know it, but a computer in California is making sure that one of their key ingredients — almonds — is always available when they need it.

The system helps the California Almond Growers Exchange (Cage) deliver the right size and variety of nuts at the right time to its customers throughout the world. The candy industry uses about 40% of each crop, and the exchange also supplies important customers in the bakery, ice cream, and grocery industries.

A cooperative owned by its 4,700 producer-members, Cage is a processing and marketing organization, handling more than 70% of the almonds grown in the U.S. All domestic production comes from 220,000 acres in California.

In addition to its industrial products, Cage markets specialty and snack items and gift packs under the Blue Diamond brand. Altogether, its inventory runs to nearly 1,000 different grades and packs of almonds.

"We will process about 85 mil-

lion shelled pounds this year," said Rupert Wrangham, secretary-treasurer of the organization. "We accept and process every pound our members produce, and our job is to return as much as possible of the sales dollar to them."

From the time the farmer first brings his autumn-ripe almonds to the Cage processing plant near downtown Sacramento, the IBM 360/40 plays a role. It begins by writing him a statement and a check for partial payment upon delivery, then continues to send him advances until he is fully

paid the following July.

While the computer handles the problems of supply, it also keeps up with demand. Many candymakers place a year's order but want the nuts delivered in monthly or quarterly installments.

The computer also helps Cage handle a thriving mail-order business. More than 225,000 customers have bought gift packs of specialty products ranging from barbecued almonds to cakes and stollens, and the IBM system records every name, address, and order.

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or 20th, and want to know more about AL/COM career opportunities in the West, contact Joe Keenan at our Headquarters Suite at the La Concha Motel. There's a golden future in the West for AL/COM frontiersmen. And if you want to stay back East, Joe will see that your resume gets to our button-down man in Princeton, N.J., Herb Fayer.



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## Okla. Blue Cross Installs Claims Approval System

TULSA, Okla. — A new computerized claims approval system is now being used by Oklahoma Blue Cross and Blue Shield (BC/BS).

Daily, the system:

- Verifies and processes 2,500 Oklahoma BC/BS and Medicare claims.

- Approves \$450,000 in benefits.

- Prints payment notices for the doctor, the hospital, or both, and for the patient.

J.M. Goodwin, vice president of operations, said, "our old system consumed seven days between the time a claim was received and the payment notice was written. Present equipment has cut that down considerably."

"A manual system could neither cope with current volume nor absorb the 13% current growth rate of our constantly changing files."

BC/BS employees, working from doctor and hospital discharge forms, enter claims directly into the computer via 12 CRT terminals.

The IBM 360/40 creates a temporary file for each claim as it is received. In the evening it compares them with its master files, matches the records requiring action, verifies certain data and either refers claims for special handling or payment.

The terminals also allow clerks to update files and give immediate answers to 2,500 member inquiries daily.

In both cases, files are called to the unit's screen by typing an identification number on the keyboard. Any changes are keyed directly into the displayed information.

In a similar manner, clerks instantaneously create new members' electronic files.

## Hospital Attempts to Apply Systems Approach to Health

PHILADELPHIA — Officials of Lankenau Hospital here and of Honeywell's test instruments division, Denver, will seek to apply a systems approach in an effort to solve mounting health care and cost problems.

"There is no reason why the systems approach used to get U.S. astronauts within 10 miles of the moon cannot be applied just as successfully to some of the staggering social problems of crime, poverty, education, welfare and health," said Arthur S.

Stankovich, director of management information systems for Lankenau.

"Social and governmental reaction to upward-spiraling hospital costs," Stankovich said, "presage dynamic changes in the health care field in the near future."

"Five years from now, a computer may warn a cardiologist about an impending arrhythmia (heart or pulse irregularity), allowing him time to take preventive action in time," Stankovich said.

The initial phase of the joint program already is under way.

## Guidance Printouts List Suitable Jobs

NEW CITY, N.Y. — A new computer service is designed to aid students and other individuals in career search by comparing their abilities and preferences with the requirements of over 1,400 occupations.

The system was created by Information Science Inc. of New City, N.Y., and Sextant Systems Inc. of Milwaukee.

The service includes a printout on the 20 occupations most suited to an individual and points to a detailed description of each occupation taken from Sextant's career series.

The new guidance service has its greatest benefit in the time savings over manual use of the Sextant career profile, the creators say. An individual search of the 1,400 occupations would require several hours. By using an IBM 360, the same operation takes less than a minute and costs less than \$6 per student on a classroom basis, and less than \$20 for a single search, they say.

The application form not only includes questions about abilities but also about preferences and personal traits. Upon completing the self-evaluation profile, with the help of teacher, counselor and parents, the individual submits it to Information Science for a printout on the 20 jobs he is best suited for and a description of each.

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Joe Montgomery will be at the Desert Inn, Monday night, November 17th, and Tuesday, the 18th. He can be contacted at the AL/COM Headquarters Suite at the La Concha Motel during the Conference, the 18th, 19th and 20th.

The golden West holds a brighter promise for firms who can qualify for Associate status, as well as a vastly broadened market for their programs and applications expertise. So be sure to meet our man in Vegas, Joe Montgomery.

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## Beautiful Downtown Burbank Studies Its Future

BURBANK, Calif. — Studies of future needs have led this city to forge ahead toward an advanced municipal information system.

The computerized network will link all major city departments. "We believe we're pioneers in this field, and expect this system to be a tremendous tool for planning, control, and improvement of city services," said Burbank City Manager Joseph Baker. "It's principally city-funded at the moment, but the federal government may deem it sufficiently important to warrant funding support — and to serve as a model for other cities."

Lockheed Information Systems of Sunnyvale, Calif., began a year ago to help Burbank plan an integrated data system for the

city, an industrial and residential center of 100,000 in Los Angeles County's San Fernando Valley.

Drawing on earlier studies by University of Southern California urban specialists — and working with USC in a city-company-university effort — a Lockheed team headed by systems consultant Judith Moss scrutinized the way information moved among and within city departments.

The Burbank City Council has approved the overall system concept and allocated \$400,000 for data processing. The allocation covers expansion of the city's data processing staff and Lockheed's work in implementing the system's first phase over the next year. Baker now is recruit-

ing key information systems personnel.

The first implementation task will be conversion to advanced computer processing of the billing of customers of the Burbank city-owned utilities — water and electricity — looking toward its relationship with the next system segment.

This next segment will be a "land inventory" subsystem that eventually will cut across organizational lines and give the city-wide system its first real multi-departmental operation.

The land inventory subsystem will control and update land information needed in day-to-day operations of diverse city departments, as well as for planning. Baker said the subsystem will enable the city to analyze its

problems in dynamic new ways.

"For example, we can correlate the number of juvenile crimes in a certain area with the availability of recreational facilities in that area," Baker said. "Or we can look at concentrations of traffic accidents in terms of the physical layout of the streets."

"This will help us understand how the work of one city department may affect the operations of another — how the Parks and Recreation Department's work affects police activities, for instance."

"Obviously, this can be instrumental in solving or preventing problems and in showing us how and where tax dollars should be spent."

Meanwhile, officials and other employees who will be directly

affected by the new information system will be learning methods by which they can use the system to Burbank's greatest advantage.

Baker said it will take at least five years to implement the system fully — but when completed, the system will streamline information flow among departments as diverse as police, finance, and library.

He said although the system will not provide drastic reductions in city operating costs, it will permit indirect savings by reducing the rate at which Burbank is expanding its clerical staff. Many routine "paperwork" tasks will be performed by the computer, Lockheed claims.

## Computer Checks On 1,000-Degree Steel Furnace

PITTSBURGH, Pa. — A computer here is helping researchers at J&L Steel Corp. take a close look into a 1,000 to 3,000-degree blast furnace 100 miles away.

The research project is aimed at improving the understanding of the chemical and physical changes of the ironmaking process.

By installing the computer at the research center in Pittsburgh and connecting it via instrumentation to the furnace site in Cleveland, the computer's operating environment is being maintained while studying the blast furnace under real operating conditions.

An IBM 1800 data acquisition and control system here is linked to a series of measuring instruments in Cleveland. An IBM 1070 process communication system converts instrument readings gathered in Cleveland to digital form for transmission over telephone lines to the computer at J&L's Graham Research Laboratory.

Dr. William E. Dennis, J&L's director of research, said, "Many variables affect the reactions which occur in a high temperature furnace. Understanding these processes traditionally has been limited by the difficulty of obtaining timely data."

"Very often, operating irregularities could not be determined and corrected until the molten iron had been tapped from the furnace and analyzed," he said.

The blast furnace under study is the "Susan" furnace, which has been equipped with the measuring instruments to record information for close control of furnace heat and mass transfer balances — factors which determine furnace efficiency.

Variables to be closely studied during the research project include raw materials; top gas analysis, pressure, and temperature; hot blast temperature, pressure, and moisture; burden weights; coke weights and moisture; oil injection rates; hot metal temperature; stack temperature; and hot metal and slag analysis.

## 2 new data multiplexers

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**FULL CONTENTION** is the big feature of the compact ADS-630, the new economical bit type time-division multiplexer. With it, you can expand your real-time telephone/computer network — pyramid data terminals and utilize all low speed computer ports on a first-come/first-served dial-up basis. ADS-630 will increase system efficiency; reduce costs dramatically.

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# Some plain talk about communications processing

Historically, computers have been viewed as automatic devices for numeric computation or volume data processing, and advances in computer technology have almost exclusively involved increases in these capabilities.

Today digital computers are faster and more powerful than ever. But the technology of data collection and dissemination has not kept pace.

Because of the urgency of much of the information processed by the computer it is essential that it respond within a time frame that its results can be meaningfully utilized. And so it has become vital to transmit input data directly from its source to the computer and output data directly to its destination. Furthermore, in order to economically distribute the power of a large scale computing system, or to effectively utilize the inherent value of a centralized data bank, it has become necessary to communicate directly and simultaneously with many geographically remote areas.

To meet these demands the computer came to be used not only as a computational device in the traditional sense, but as a device for the control of the communications network itself.

In order to perform this function, of course, a portion of the computer's time was required. But to the extent that a computer performs communications and control processing, its capacity to perform its conventional computation and data handling tasks is diminished. More importantly, the real loss in having the central computer handle communications and control processing is that it was not designed for these purposes; often its capabilities can be adapted to

such uses only in a cumbersome manner (for instance, it may not have the proper character handling instructions), or it has expensive capabilities which cannot be effectively utilized (floating point instructions, for example).

**Here's what it means in dollars and cents . . . if you have a \$1 million computer, and 30% of its capacity is taken up with communications processing (in many systems the percentage is much higher), you really have a \$300,000 communications processor.**

That's an expensive piece of hardware, to say nothing of the complex and equally expensive operating system required to control it. An internally programmed communications and control processor specifically designed for those applications is a superior — and less expensive — way to go.

The CC-70 Programmed Buffered Multiplexer, first member of a new family of communications processing systems being introduced by Computer Communications is specifically designed for real-time communications and control applications. It does a better job than the central computer. And it does it far more economically.

The CC-70 relieves your central computer of the high overhead tasks associated with line handling, polling, queuing, and message assembly.

Under stored program control, the CC-70 can handle multiple lines of varying speed — and transmission characteristics in the same system. Line adapters are offered for all standard data sets, full or half-duplex, synchronous or asynchronous, at speeds from 110 bps to 50,000 bps and higher.

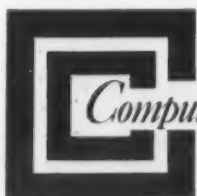
Hardware modularity and program flexibility are central to the design of the CC-70. Its line handling capability can be increased on a plug-in module basis. Memory banks of 8K bytes each can be added up to 64K bytes. Peripherals and additional processing units can also be easily added.

The CC-70 comes complete with line handling and central processor interface programs, making it the most flexible communications handler around. And, unlike most communications processing systems, standard computer channel interfaces are available to tie the CC-70 to most popular computer mainframes, including the IBM System/360 and 1130 computers, the CDC 3000/6000 series, and the XDS Sigma series.

We'll be demonstrating the powerful capabilities of the CC-70 at the Fall Joint Computer Conference. You can see it there, or write Computer Communications for detailed information.



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# Addict's Brain Wave Patterns Tell Which Drug They Take

NEW YORK — Scientists at New York Medical College are investigating ways to counteract the effects of narcotics and hallucinogens by classifying and identifying brain-wave patterns of those addicted to drugs.

Using an IBM 1800 data acquisition and control system, Drs. Max Fink and Donald Shapiro, professors of psychiatry, are measuring the effects drugs have in changing brain-wave patterns known as electroencephalograms (EEG).

By analyzing the influence of drugs on the brain, the doctors hope to find new compounds for treating depression, psychoses, and addiction.

Brain waves are good indicators

of each individual's reaction to drugs, notes Fink. The brain waves provide a measure of such behavioral states as euphoria, alertness, fantasy, anxiety, or irritability. Different dosages of drugs often show up in different EEG patterns.

Fink believes an EEG is a reliable and recordable "quantifiable test" of such mental states and is particularly helpful in defining compounds that are antagonists to opiates and hallucinogens.

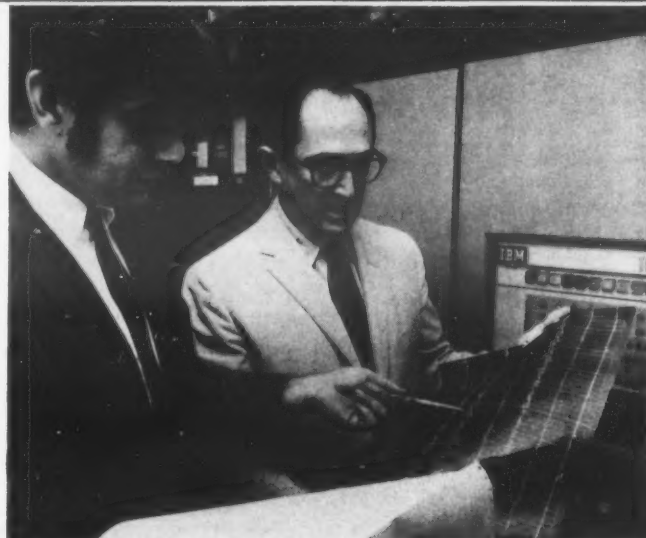
"In our programs for treating opiate addicts, we test each patient with different compounds while observing the changes in EEG and in clinical symptoms," Fink explains. "The EEG re-

flects each person's individual response to a drug and to each antagonist. We try to treat each subject with the best available antagonist."

By measuring the types of change, the rate of change, and interactions following administration, it is possible to classify drugs affecting the central nervous system. This data is the basis for studies of new drugs and new applications for existing drugs.

Fink and Shapiro believe the computer holds promise as an aid in treating the mentally ill individual requiring drug treatment.

"We hope to find the optimal method for treating each patient



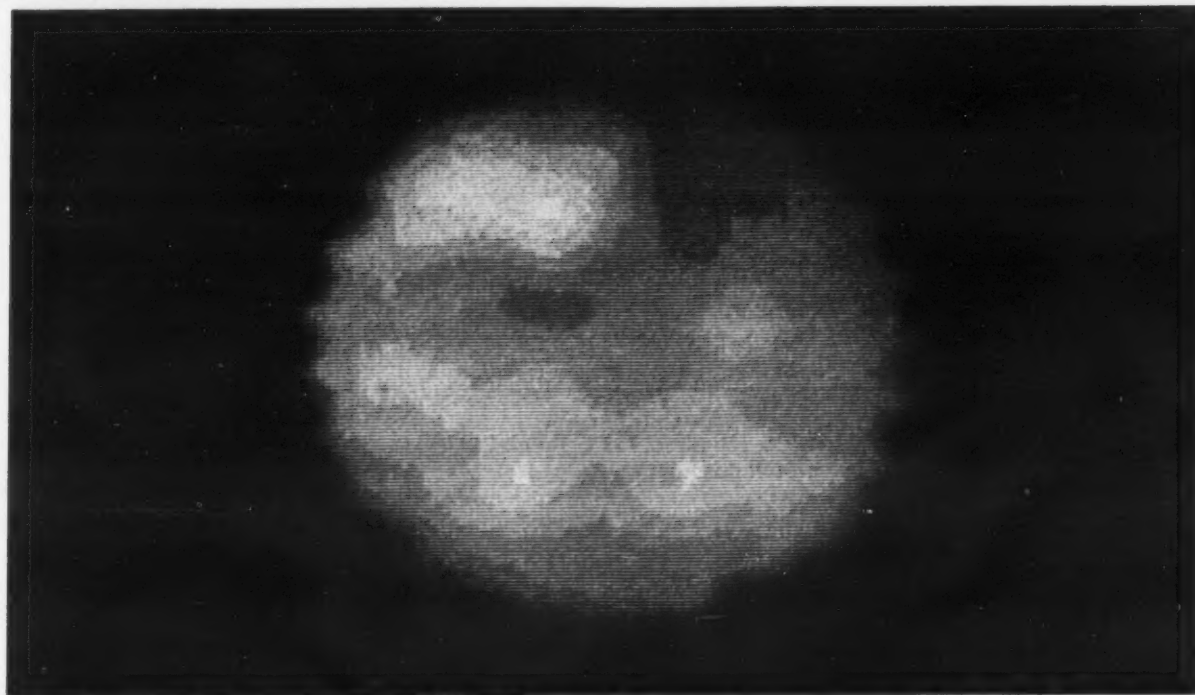
Dr. Max Fink (right) and Dr. Donald Shapiro, professors of psychiatry, study brain wave patterns.

with mental illness by selecting the best ways of altering a pa-

tient's brain functions for therapeutic ends," explains Fink. "The computer helps us classify and identify existing drugs, new drugs, and new combinations of drugs."

"Once we can determine the characteristic EEG 'signature' of the drugs useful in treatment, we feel we may be able to predict their clinical use with greater accuracy than at present," he adds.

Applications of the EEG classification projects have been found in treating therapy-resistant psychotics and opiate addicts.



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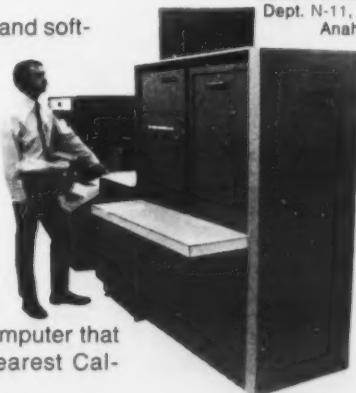
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## Order System Handles Varied Customer Needs

GARDEN CITY, N.Y. — Oxford Pendaflex Corp., a manufacturer of filing supplies and equipment, has developed a computerized order-entry system with a data base detailing the unique requirements of each customer.

Under the system, monitored by an NCR Century 100, the requests are triggered automatically, based on the nature of the transactions, and the information is drawn from the memory file and applied. Orders with weight, truck, or carload restrictions are internally converted to cubic measure and pounds and are compared with the limitations stored in the computer. If they do not meet the requirements, the orders are flagged.

In the past, orders were processed manually and passed through an editing, routing, and shipping cycle. The process became too cumbersome and complicated to be handled efficiently by clerks, no matter how capable. The volume and intricacies made some errors unavoidable and complicated procedures so that out-of-town shipments were taking four and five days to deliver.

The current system automated the clerical functions and allows the information collected in the process to be refined for management reports. The procedure also is integrated, in that order processing automatically updates inventory and accounts-receivable files stored in the computer.

When an order is received, it is edited, coded, and punched into tabulating cards. The cards are

(Continued on Page 81)

## Order System Keeps Inventory On 2,000 Items

(Continued from Page 80)

entered into the computer for storage on a magnetic disk file.

To accomplish this, the computer, which is said to operate at a cycle time speed of 800 billionths of a second, passes the order information against a master customer file containing names and addresses, products usually bought, routing, shipping instructions, and credit limit. The customer information, like most data in the computer file, is stored on magnetic disks with a capacity of four million characters.

The disks are operated on dual-spindle units. The stored data is accessible at random and drawn into the processing cycle automatically when needed.

At the same time, the price of the items is picked up from a master item file, also stored on disk. The information in memory includes six or seven quantity discounts, warehouse location, production cost, description, and group and product line. Previously, this information was filed in several different locations and was, therefore, difficult to compile and use.



Punched cards are removed to be entered into order processing system.

The NCR Century, working with the available data, determines the total value of the order and whether it falls within prescribed credit limits. If the order exceeds the credit limit, the computer prints a report which is reviewed by the credit department.

If the order passes the various computer and, if necessary, management checkpoints, stock is removed from the inventory file and allocated for shipment. A running inventory is maintained. Each of the over 2,000 stock items has been assigned a review level, a reorder point, and a signal indicating an abnormally large demand.

Eventually, the file will be woven into an automated reordering system, reported Robert Lunder, EDP manager. But, for the present, it serves as a management tool in restocking depleted supplies.

"The reason we want to know about unusually large orders," explained Lunder, "is so we can adjust production to fill voids created by unexpected demands." Previously, Oxford relied on a clerk to spot and report unusual orders.

Later on, the computer also will be used in production planning, scientific forecasting, simulation studies, accounts payable, payroll, cost distributions balanced against budget allocations, and detailed marketing research.

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# How Much Beer Will British Drink Next Month?

MANCHESTER, England — A computer model to forecast beer consumption in the U.K. so that bottle production may be geared to demand has been developed by United Glass.

Figures of monthly beer sales between 1959 and 1966 were used as the raw data for the model and showed that the pattern of consumption was affected by two principal factors. These were a trend producing a steady increase in beer consumption over successive years and seasonal variations within each year (50% more beer was often drunk during the peak month August, for example, than during March, the minimal month).

To determine the relative importance of the many factors contributing to the basic but

complex pattern of demand, the statistical package developed by ICL for its 1900 Series computers was used. The method adopted was simply to guess at as many likely contributory factors as possible and to investigate the importance of each by statistical analysis.

For example, temperature and sunshine were automatic choices because one would expect beer consumption to increase during hot weather.

On the other hand, one might expect a particularly rainy month either to keep people in their homes and decrease beer consumption, or alternatively to increase beer consumption by curtailing outdoor activities.

It is only by statistical testing that the relative importance of

such variables can be ascertained, and when the number of variables involved is greater than three or four, the manual effort required becomes prohibitive. The ICL statistical analysis package will cater to around 100 variables and is limited only by computer size and speed.

Not all variables could be usefully incorporated in the model because ultimately they themselves would need to be forecast. For example, wine and spirit sales almost certainly affect beer consumption. However, these parallels would be equally as difficult to forecast as beer consumption. Consequently, variables were chosen for which reliable forecasts were available.

The chosen set of variables were processed both in their

standard form and with various modifications. For example, since the figures of beer consumption were essentially restocking figures, it was important to investigate the effect of, say, temperature on beer consumption for several months previous. This was equivalent to creating new variables. The total set consisted of 49 variables.

The initial computer calculation singled out the important variables and produced a reduction in number to nine. This reduced set was then used as the basic data for a regression analysis. This technique produces a forecasting model in terms of the most important variables as judged by statistical testing.

The statistical analysis package incorporates a routine that will

optimize the regression for a set of a given specified size and, for each regression, parameters are printed out which show the power of the resulting equation as a forecasting model.

By optimizing the regression for various sizes of regression set, a final model was chosen based on the following three variables: press and television advertising; air temperature; and disposable income.

The regression equation was as follows. Beer consumption next month =  $-0.365 + 0.965 \times 10^{-6}$  (press and television advertising this month) +  $0.7748 \times 10^{-4}$  (disposable income this month) +  $0.0231$  (average air temperature this month).

If this model had been used for forecasting monthly for the years 1959 to 1966, it would have been accurate within 10% on 90% of occasions.

## Despite what you've heard, there's only one Data Entry System that does it all!

The North Electric Message-Composer™ System is the only complete system adaptable to any and all tasks that require punch cards, key tapes, hard copy or any combination of these. It is designed to work with

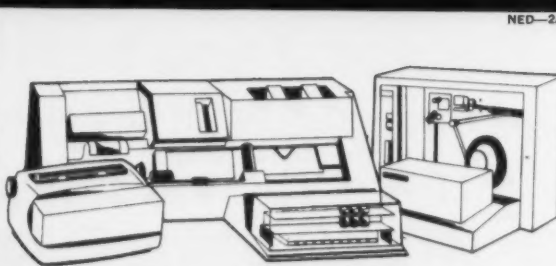
all existing computer feeding equipment. The Message-Composer System is available for immediate delivery from stock on an outright purchase plan... or, can be leased for under \$95.00 per month.



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The Message-Composer System can transmit messages to any point and, automatically operating a North solenoid pack, produce punch cards, key tapes or typewritten copy—all three if required.

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## Typed Letter Cost Halved

SPRINGFIELD, Ill. — Franklin Life Insurance Co. here uses a computer to type personalized sales and service letters.

George Hatmaker, president and chief executive officer of Franklin Life, said the Prospector Direct Mail Service has cut the average cost of a letter from 47 to 23 cents.

"In addition to this economy, the program provides better service to our agents and policyowners by responding more quickly to their requests and needs," he said.

Hatmaker said letters previously were typed on semi-automatic equipment requiring close supervision. Personalizing the letters and typing envelopes resulted in time-consuming stop-start procedures, he said.

Now, variable information such as names and addresses is stored in the computer until needed. As a letter is typed, this data is inserted automatically.

More than 250 different letter formats are stored in the IBM System 360/30. New texts can be added and existing ones changed at any time.

"These letters are designed to introduce the agent in a friendly, businesslike way to prospects," Hatmaker said. "We feel the letters must be personalized and neatly typed to make a good impression. The computer helps us do that."

Agents send requests for mailings to company headquarters here. The two broad categories of mailings are sales letters to new business prospects and service letters to current policyowners. Approximately 25,000 sales letters are mailed each month while about 11,000 service letters are sent, advising subscribers of conversion possibilities and other options.

Agent mailing requests must include the names and addresses of recipients, in the case of a new prospect list, plus the title of the letter or letters to be sent. If the names are already on file, the agent refers to the list by its code heading.

An operator enters the mailing data into the Model 30 through an IBM 2741 communications terminal.

## Production Control System Makes Good

GRAND RAPIDS, Mich. — A production scheduling and control system specifically designed for the metal fabrication industry is being used at Knap & Vogt Manufacturing Co., a manufacturer of adjustable shelving and other hardware products.

Unable to cope with its information needs manually, the firm installed a computer to handle production scheduling and control. "Oftentimes, computers are installed to process conventional accounting applications such as payrolls and accounts receivable and payable," Frank E. Hild, controller, states. However, we handle these jobs on several electronic accounting systems and there just isn't that much room for improvement. The greatest opportunity for making money with a computer, in our opinion, is in production."

Production orders are punched into cards and entered in the Century computer system, which includes a central processor with a storage capacity of 16,384 characters, an integrated dual spindle disk unit with a storage capacity of more than 8.4-million characters, a 450 line/min printer, and a 300 card/min punched card reader.

Basic order data entered in the computer includes part number, quantity, and completion date. The computer uses a routing file stored on its dual spindle disk unit to make a complete breakdown of each order. The file contains coded routings for close to 6,000 parts. Routing information includes job descriptions, work center designations, bill of material requirements, and estimated cycle times for each operation involved in making a part.

The computer backs off cycle times, sets up a completion date for each operation, makes extensions of bills of materials, and prints out production orders which include the following data: part names, number, finish, and latest revision date; order number, quantity, issue date, and scheduled start and completion dates; extended, descriptive bill of materials; and sequence numbers, work centers, codes, set-up times, standard times, extended times, descriptions and scheduled completion dates for all operations involved in each order — normally, there are three to four operations per order.

Knap & Vogt usually enters only orders for finished stock items in the computer. An additional program prepared by the firm automatically produces orders for required subassemblies, creating scheduling dates for these orders which are based on completion dates of finished stock item orders.

At the same time that orders are being printed-out, all pertinent order and operation data is stored in a work-in-process file contained in the computer's dual-spindle disk unit. Copies of the order are then distributed to work centers and other affected departments.

Each day, job reports come back from the factory. Averaging 800 a day, they include the following data: production order number, operation sequence

number, quantity completed, actual time, and completion date. The job reports are used to update the work-in-process file from which information is extracted for daily behind-schedule, quantity deviation, and effectiveness reports.

In addition, following the issue of production orders each week, the computer produces a load report. Organized by work center, this report shows the number of hours each work center is behind schedule as of the report date; available hours, loaded hours, and percent of loading for each of the four weeks; and future loading beyond the upcoming four weeks.

"Each week, the load report shows the effect of new production orders on each of our 110 work centers," explains Frank

Hild. "In effect, the report shows what is going to happen before it happens, enabling us to anticipate in advance and move to correct overloaded work center situations."

To complement the computerized production scheduling and control system, Knap & Vogt has created a new production control function. In addition, the firm is now working on plans for additional computer applications.

"We have plenty of time available on the computer for other functions," Hild explains. "Our next step will be to computerize inventory control that is currently maintained manually on cards. This is another area where money can be made through the use of a computer."

"Actually without the com-



File containing coded routings for close to 6,000 parts is maintained on dual-spindle disk unit which has a storage capacity of more than 8.4 million characters.

puter, we would be unable to grow efficiently," the controller sums up. "But, by using the computer as a production rather

than merely a bookkeeping tool, we now have the capability to insure that growth is not only efficient but profitable."

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**Telex 5314**  
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#### Fastest Access — Fastest Start-Up

Telex's two new Disk Storage Drives offer by far the fastest access and fastest start-up of any disk pack type drive. Compare them with their IBM counterparts:

	TELEX 5311	IBM 2311	TELEX 5312	IBM 2314-A1
Access Minimum	10 ms	25 ms	10 ms	25 ms
Access Average	30 ms	75 ms	32 ms	60 ms
Access Maximum	60 ms	135 ms	60 ms	130 ms
Start-Up Time	15 sec.	60 sec.	20 sec.	60 sec.

#### IBM Compatibility

In addition to superior performance, Telex's family of Disk Storage

Drives provides plug-to-plug compatibility with the IBM 2841 and 2314 controllers, and data interchangeability with the IBM 2311 and 2314 Disk Drives.

#### Greatly Improved Reliability

Through the use of an electromagnetic actuator and an electronic positioning control system, the Telex Disk Drives eliminate many of the reliability problems present in most of today's hydraulic and mechanical devices.

#### Improved Systems Throughput

The improved performance of the Telex Disk Drives in access time, start-up and reliability result in increased systems throughput, thus providing more value for your data processing dollar.

#### Telex Service

Telex nationwide service network provides highly trained service personnel to assure Telex Disk Storage Drives as reliable members of the computer system.

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# "The NCR Century has got to have the wildest price/performance ratio in the industry."

—Roger Horsfield, Data Processing Manager, Struthers Nuclear & Process Company, Warren, Pa.

Mr. Horsfield is a computer professional with Struthers Nuclear & Process, a highly diversified company.

He's in charge of an EDP operation that leased a small NCR computer, bought time from a local IBM 360/30 and time shared from a central Univac 1108.

His operation handled a wide variety of programs: production control, administration, payrolls, inventory and a heavy work load of sophisticated engineering data. He used COBOL on the 360/30 and FORTRAN on the Univac.

But Struthers wasn't fully satisfied with this set-up. They wanted a computer system that would get more in-house capabilities yet possibly maintaining the on-line hook up to the Univac.

After an eighteen-month equipment survey, Struthers selected the NCR Century Series. Hands down, against all comers.

How come?

Because NCR has a computer with a "wild" price/performance ratio that will not only handle all the administrative and accounting programs but could take over some of the sophisticated engineering work as well. An unexpected benefit! Mr. Horsfield is planning to do many of these jobs in-house. For less.

An NCR Century 100 has already been delivered that's doing all the COBOL programs. "We were prepared," Mr. Horsfield says, "to pay \$7-8,000 a month for what this Century is giving us for about \$3,000." Struthers is expecting delivery of a larger NCR Century—a 200—in the near future that will give them in-house FORTRAN capabilities. And since the NCR Century Series offers true upward compatibility, Mr. Horsfield can run all his COBOL programs on the larger computer without any re-programming.

**A new breed that gives you more, for less.**

The NCR Century Series of computers does not use conventional or

hybrid circuits. It has monolithic integrated circuitry throughout. Only six different patterns make up 80 percent of all its logic circuitry. All the power and reliability—and more—of the hybrids. At a fraction of their size and cost.

Our memory concept is entirely new. Thin film short rods. With speed in the 800 nanosecond range. Yet it's lower in cost than slower core memories because of automated manufacturing techniques.

Each NCR Century gives you at least one dual spindle disc unit with 44 ms average access—the fastest removable unit offered by any main-frame manufacturer. This concept offers the user of even the smallest NCR Century efficient magnetic file processing at lower cost.

## Hardware...

The NCR Century 100 has an internal memory of 16,384 bytes of ultrafast memory (additional 16K is only \$375 more a month). The NCR Century 200 can expand to 512K. 3-way simultaneity is standard on the 100; 5-way on the 200 which can be expanded to 9-way. This means handling many functions simultaneously including processing.

Each dual spindle disc unit stores and makes instantly available over 8.3 million bytes at a 108 KC or 180 KC transfer rate.

Normal input is through punched card or tape readers (you can go on-line, too). Printing ranges from 450 to 3,000 LPM. The top speed is standard for the NCR Century 200; optional for the 100.

Great expandability. Move up to multiprogramming. Or just move in a more powerful processor with the same peripherals. You can increase throughput with higher speed units. They include mag tape drivers, CRAM (Card Random Access Memory). Removable disc units. Paper tape readers and punches. Card readers and punches. OCR. MICR. CRT units.

## ...And software, too.

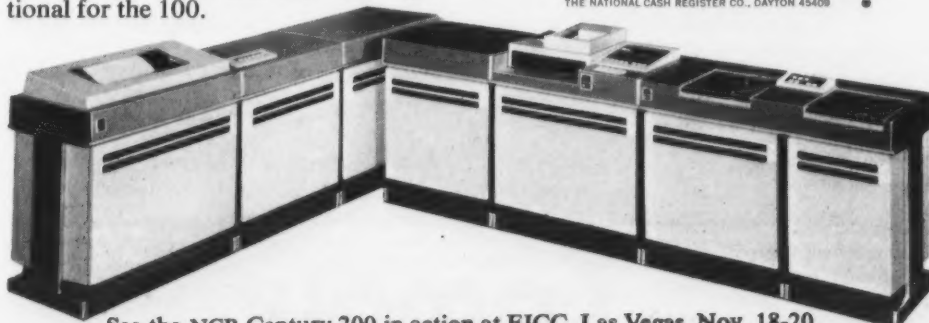
No other computer in the NCR Century price range offers so much. Applied programs. Languages. Compilers. Operating systems. Utility routines. (Mr. Horsfield says, "One of the things we were concerned with was the operating system. The NCR Century system is flawless. And NCR Century's overhead speaks for itself—4K versus IBM's 8K.")

He also says nobody delivers a COBOL compiler as good as NCR's for anywhere near the price. FORTRAN and our NEAT/3 are available, too.

The basic NCR Century 100 (a complete system) rents for \$1,910 a month on an extended contract. The NCR Century 200 starts at \$3,350.

We say that the NCR Century is 30-50% percent more productive than competition, at from 30 percent lower cost. And we can prove it.

Write for your fact-filled, eye-opening brochure on the NCR Century Series. EDP Products Marketing, NCR, Dayton, Ohio 45409.



See the NCR Century 200 in action at FIJCC, Las Vegas, Nov. 18-20.

## Computer Ends Semi-Annual Registration Nightmare

BOULDER, Colo. — A computer registration system that saves time for both students and faculty, holds class conflicts to a minimum, and provides great scheduling flexibility has been in operation at the University of Colorado for two years.

With the previous system of manual registrations, more than 200 faculty members spent two days in the crowded and confused atmosphere of a field house, sectioning students into classes, listening to complaints, and juggling class cards with consideration to class limits and students' wishes.

Now, a CDC 6400, which is used for research, instruction, and administrative work, keeps track of all class limits, requests, space limitations and course sections and frees faculty members

for more important tasks.

Quick analysis of class data permits department heads to adjust class limits, create or eliminate sections of courses, and make room or faculty changes as enrollment demands are reported. This process makes it possible for administrators to see the overall registration picture before assigning staff and budgets for the semester.

The system has been used for student registration for four semesters and during the last registration served 18,200 students. These programs were written in Cobol by an administrative group.

The system fulfills 70% of the students' requests for time and sections, and students are able to reserve class periods for ap-

proved nonacademic activities. Conflicts are held to less than 1.5% of some 82,000 total requests, and most of these involve single section courses. Requests received during registration are totalled and reported by course and section to the deans and department chairmen for rescheduling before the first student is sectioned.

Controlled enrollment is possible with the computer system — that is, sectioning certain students into a course or excluding certain groups, such as freshmen. Variable credit courses, class lists, and enrollment summaries are handled by the system.

Students who were registered the previous semester may take advantage of an advance registra-

tion by mail for the fall semester, Dr. E. Rex Krueger, director of the computer center, noted. Students can mark sense their request cards at home, allowing them a few more days of work or preparation for the semester before returning to Boulder.

"The program allows the university to more closely meet students' needs by rescheduling classes according to requests," Krueger explains. For example, in the past few semesters there has been a trend away from physical sciences to the social sciences.

Eventually, library information and student housing requests will be handled by the 6400, which will also project university needs in research, faculty, and space.

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November 19, 1969

Page 87

## Travelers - Randolph Union OK'd

HARTFORD, Conn. — The Travelers Corp. and Randolph Computer Corp. have announced the completion of the acquisition of Randolph by Travelers.

Randolph stockholders approved the transaction on Nov. 6.

The proposed acquisition by Travelers of Randolph Computer was first announced Aug. 1.

Roger C. Wilkins, Travelers president, said that Randolph will continue as a separate subsidiary of Travelers with headquarters in Greenwich, Conn.

Elected to the board of directors of Randolph Computer were Wilkins and Travelers' senior vice-presidents Frederick C. Maynard Jr. and Thomas F. Malone.

Continuing on the Board are John M. Randolph, chairman; Glen W. Bailey, chairman of the board and president of Keene Corp.; Adrian W. DeWind, partner, Paul, Weiss, Goldberg, Rifkind, Wharton and Garrison, attorneys; Alfred W. Kleinbaum, partner, Wertheim & Co.; and John L. Roy and Cornelius T. Ryan, officers of Randolph Computer.

Terms of the agreement call for the exchange of 1.25 shares of Travelers common stock for each share of Randolph common.

## Planning Research Earnings Post 28% Gain During First Quarter

LOS ANGELES — Earnings of Planning Research Corp. were up 28% to \$731,648 or 16 cents per share in the three months ended September 30 — first quarter of fiscal 1970.

This compares with \$573,563 or 12 cents per share in the same period last year as restated to reflect pooling of interest with acquired companies. Per share figures are based on a weighted average of 4,712,241 shares outstanding in the quarter just ended.

Gross revenues in the quarter were \$14,847,208, up 16% over the \$12,781,900 in the first quarter last year as restated.

Dr. Robert W. Krueger, president, noted, however, that when quarterly figures are compared with those actually reported by the company a year ago, they show net earnings up 106% and earnings per share up 60%, from 10 cents to 16 cents. Gross revenues were up 149%.

### A True Measure

"We regard these latter comparisons as a true measure of the corporation's growth," Krueger told shareholders at the Century Plaza Hotel. "They show that we are more than maintaining the 35 to 40% average annual growth rate which is our corporate goal."

"We made substantial progress in expanding our total capabilities in the professional services during the past year," Krueger said. "As a result our ability to deliver a turnkey job — from concept to delivery of an operating system or a specification for a system — has been vastly enlarged."

"It is clear that the turnkey

idea defines most clearly where we are going in the future and in part the organizations that we want to bring with us.

"Other fields that we are interested in tend to define the organizations that we might want to acquire. In urban development we already have capabilities in public administration in urban problems, transportation planning, engineering, sociological and psychological capabilities — all from our subsidiaries — and our own systems analysis capability. But we don't have enough capability in the field of urban design, so an architecture organization that specializes in urban design is the kind we are now looking for to bring into our family of companies," he said.

In other business, the shareholders reelected all members of the board, including Robert B. Anderson, former U.S. secretary of the treasury, who accepted a seat on the board in August.

Shareholders also approved an increase in authorized common stock from 10 million to 25 million shares and a new restricted stock option plan for directors and officers.

## Datamation Services' Nine Month Sales Drop; Results Prove 32¢/Share Lower

NEW YORK — Datamation Services, Inc. reported sales of \$3,687,161 for the nine months ended Sept. 30, 1969, compared with sales of \$4,097,560 for the same period last year.

A net loss of \$170,615, or 15 cents per share, was incurred for the period, compared with net income of \$184,858, or 17 cents a share, for the first nine months last year.

Figures for the nine-month period of both years are based on the average number of shares outstanding. Results for both years reflect the acquisition of Computer Systems & Education Corp. (CSEC) on a pooling-of-interests basis March 7, 1969.

Thomas T. Connors, president, said that the company, which operates data processing centers and technical schools, has encountered substantial start-up costs over the last nine months in connection with software development, promotion, and sales. These costs have not as yet been offset by newly generated business.

He noted, however, that response to the programs developed by the company "is beginning to show that we're headed in the right direction."

He said that Datamation Services now has over 20 customers using the company's proprietary software packages. This is all

new business in the past year, he noted, above and beyond the normal data processing service business amounting to repetitive annualized sales in excess of \$250,000.

Connors also noted that Datamation Services inherited considerable operational problems with the acquisition of CSEC. Enrollments are at a lower level than anticipated, possibly because of the Vietnam situation and a slowed economy.

Also, he said, the CSEC division has been adversely affected by the failing health of its chief executive, Robert W. Herforth, whose sustained illness has required his absence from the company for extended periods since the first of the year.

Herforth has since resigned and, in a managerial reorganization, Charles R. Bourland Jr., CSEC's president and treasurer, now heads the schools operation, and David S. Shefrin, executive vice president and secretary of CSEC, is in charge of the data processing service bureau operation.

## WU Restructuring Plans Approved by Stockholders

NEW YORK — Western Union shareholders voted overwhelmingly to restructure the national communications company to take maximum advantage of future growth opportunities, emphasizing information handling and communications.

When the restructuring plan has been approved by the necessary regulatory agencies, the Western Union Telegraph Co. will become a subsidiary of a new Delaware corporation, Western Union Corp., which will own all of the common shares of the telegraph company.

Restructuring will provide Western Union with a broader corporate charter, greater management and financing flexibility, and the ability to offer non-regulated communications services through separate subsidiaries.

Approval required a favorable vote by holders of two-thirds of the common, 4.6% and 4.9% convertible preferred shares voting as a single class, as well as by a majority of the common and two-thirds of the 4.6% and 4.9% convertible preferred, each voting as a separate class.

Russell W. McFall, chairman and president of Western Union, described the restructuring plan as "one of the most important proposals made by Western

Union management since the company was incorporated 118 years ago."

### Rapid Transition

Speaking at the special shareholders meeting, McFall said, "The restructuring concept is an outgrowth of a new management direction that has led this company through a very rapid transition in recent years."

"It was this new management direction that led to the development of Western Union's nationwide computer-linked Telex network and our recently introduced shared-use computer communications systems for the securities industry and general business use."

"And it is this new management direction that ultimately should lead to a further broadening of our total communications capability — to where we will be able to handle the entire spectrum of information handling requirements of business, the government, and the general public."

"Restructuring the company should help speed up this transition even more, while enhancing Western Union's ability to grow and to meet expected demands for increasingly sophisticated communications systems and services," McFall said.

## Redcor Authorizes More New Shares

CANOGA PARK, Calif. — At the annual meeting of Redcor Corp. shareholders unanimously voted to increase the authorized number of shares of Redcor common stock from one million to five million shares.

Immediately following the shareholders meeting, the board of directors reaffirmed the issuance of a 100% stock dividend, previously voted. The stock dividend will be issued on Dec. 1, 1969, to those share-

holders as of record on Nov. 5, 1969.

### Datatab Trades on NSE

NEW YORK — The common shares of Datatab, Inc., a computer service company with data centers in New York City, Chicago, and Los Angeles, were admitted to trading on the National Stock Exchange.

Datatab, whose ticker symbol is DTB, crossed the tape at 7-5/8 on an opening trade of 100 shares.

## New Company Viewpoint

### Planning Stressed as Crucial Factor

By Art Martin

Special to Computerworld

The computer industry is now beginning to fully emerge into its many significant segments — mini-computers, time-sharing, proprietary packages, terminals, systems engineering, peripherals, leasing, communications companies, and many others.

The opportunity exists for many computer companies to grow into extremely large, profitable, multiproduct firms.

There are, however, some extreme challenges awaiting those who enter the glamorous computer field, for example:

- When Mohawk Data Services first came out with key-to-tape terminals, people expected the IBM sales force to wipe them out in three months, whether Mohawk had a good idea or not. Look at Mohawk today, but also

look at how many key-to-tape manufacturers are now in the field.

- There was a time when time-sharing on Wall Street meant stacks of money to each newcomer. Today, some people who should know say you can't make money at time-sharing.

- On the financial side there are a lot of computer companies who went "public" very early in their corporate life, have spent those public dollars, and now must return to the money market with a stock whose price is below the original offering.

- What about the institutional investor? He has those badly needed dollars and he wants to make them work. Memorex is understandable, but a proprietary software product to process a data base from a terminal using Isam, (a keyword

retrieval system) is another thing.

### Planning Is the Key

What is the answer to these challenges that face the new entrepreneur? For one thing, good financial planning. This may be a little new to a person who has been technical all his life, but good financial planning will mean life or death to those concepts that were worth risking a career.

A major essential to good financial planning is a sound business plan created at the inception of the business, followed during the course of the business.

The plan should contain, at the very minimum, the company's capital requirements, current capitalization, plans for the

(Continued on Page 89)

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NOVEMBER 3, 1969

## New Registrations

**KNOWLEDGE, LEISURE & TRAVEL PROGRAMS INC.**, 230 Park Ave., New York, N.Y. 10017, a company organized for developing a computerized college-selection service, filed to register 300,000 shares of common stock. Proceeds, at \$3 per share, intended for updating, expansion, and promotion of existing services; for development and promotion of proposed educational, counseling, and travel services; for establishment of a pilot company-owned "KLT Knowledge Center" in the New York area; for working capital, and for general corporate purposes, including possible acquisitions. The underwriter is Charles Plohn & Co., 200 Park Ave., New York, N.Y. 10017.

**CONCEPT SERVICES**, 260 Godwin Ave., Wyckoff, N.J. 07481, a company organized to conduct business through Concept Implementation Corp. (CIC), a wholly owned subsidiary providing computer software programming, design and analysis, consulting services and software packages, and Wyer, Dick & Co., engaged in the business of providing consulting services to the transporta-

tion industry, all of whose outstanding capital stock the company plans to acquire, filed to register 200,000 shares of common stock. Proceeds, at \$4 per share, intended to hire additional personnel; to be applied toward the cost of developing and maintaining a general marketing program; to develop and market computer software packages; to be applied toward the cost of moving to and consolidating at a single new location the offices of CIC and Wyer Dick, and working capital. The underwriter is Charles Plohn & Co., 200 Park Ave., New York, N.Y. 10017.

**DATA ASSOCIATES, INC.**, 400 12th St., S.W., Washington, D.C. 20024, a company that furnishes a variety of commercial data processing services to customers in the metropolitan District of Columbia area and suburban Maryland and Virginia, filed to register 125,000 shares of common stock. Proceeds, at \$6 per share, intended for the purchase of a Burroughs B-3500 computer system; for the purchase of 50 Burroughs TC-500s to be leased to customers; for working capital; and for general corporate purposes. The underwriter is Sealfon & Friedman, Inc., 79 Wall St., New York, N.Y.

**GRANITE MANAGEMENT SERVICES, INC.**, 500 Old Country Road, Garden City, N.Y., a diversified services organization concentrating in the leasing of both equipment and IBM 360s, filed to register 1,014,334 shares of common stock. Of these shares, 411,997 shares are issuable upon conversion of \$15 million of 6-1/4% 15-year convertible bonds of 1969 ("Euro-dollar Bonds") issued by a subsidiary, 500,000 are issuable to Western American Bank (Europe) Ltd, upon conversion of a \$15-million promissory note, and 102,337 are issuable upon exercise of certain warrants held by Banque de Paris et des Pays-Bas (Suisse) S.A. Proceeds received by the company upon exercise of the warrants will be added to its working capital and used for general corporate purposes.

**ADVANCED COMPUTER SYSTEMS, INC.**, Beaver Hill North, Jenkintown, Pa., a company that proposes to provide computer-related consulting and services to users and manufacturers of computers and to offer services which apply the technology of electronic computers to business systems and related problems, filed to register 100,000 shares of common stock. Proceeds, at \$5 per share, intended for salaries, working capital, and general corporate purposes. The underwriter is R.A. Wolk & Co., Inc., 405 Lexington Ave., New York, N.Y. 10017.

**COMPUTING & SOFTWARE, INC.**, 1900 Bldg., Century City, Los Angeles, Calif. 90067, a computing and data processing business which provides information services, financial services, education personnel services and manufactures and sells technical products, filed to register 627,468 shares of common stock. Proceeds, at \$55 per share maximum, intended for working capital and general corporate purposes. The underwriters are Merrill Lynch, Pierce, Fenner & Smith, 70 Pine St., and White, Weld & Co., 20 Broad St., both of New York.

**NUMERAX, INC.**, 467 Sylvan Ave., Englewood Cliffs, N.J. 07632, a company that proposes to offer management consulting and software services relating to data processing requirements of manufacturers, distributors, carriers, and receivers of goods, filed to register 200,000 shares of common stock. Proceeds, at \$3 per share, intended for advertising and marketing; for salaries; for research and development; for enlarging present office facilities; for leasing hardware; for opening branch offices in Philadelphia and Chicago; for working capital, and general corporate purposes. The underwriter is Charles Plohn & Co., 200 Park Ave., New York, N.Y. 10017.

**COMPUTER KNOWLEDGE CORP.**, 4502 Centerview Drive, San Antonio, Texas 78228, a company that provides data processing services through the establishment of a remote multiple-access computer center and related software programs for use in conjunction with its computer center, filed to register 200,000 shares of common stock. Proceeds, at \$6 per share maximum, intended for additional deposit in connection with leasing of a CDC 6400; for payment of first-year rental for the CDC 6400 system; for working capital, and for general corporate purposes. The underwriter is Russ & Co., Inc., 1600 Alamo National Bldg., San Antonio, Texas.

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The 30-foot Novation exhibit is just that. A colorful collection of some of the West's finest modern paintings. Plus a quiet soft-sell display of Novation's exciting products...including the complete line of modern enclosures which reduce the noise output from Teletype printers by more than 50%...and the first showing of the most advanced acoustic data coupler industry has to offer.

### Win a Valuable Modern Painting

Paintings from many of the West's leading contemporary artists will be displayed. And here's how you can win one for your home or office.

Just drop by the Novation booth during the show and fill out the card. A drawing will be held on the final day of the show.

And you do not have to be present to win.

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## Air Force Invites 45 Companies to Bid On Replacement of 95 Military Systems

HANSCOM FIELD, Mass. — Requests for proposals from 45 firms interested in replacing 95 Air Force Logistics Command computer systems have been invited by the electronic systems division of the Air Force Sys-

tems Command.

The new equipment will replace computer systems at Logistics Command headquarters at Wright-Patterson Air Force Base, Ohio, and five Air Materiel Areas, according to Col. Robert

L. Jones, head of ESD's electronic data processing equipment office.

The equipment will also provide the nuclear ordnance logistics support systems with modernized data processing capabilities.

Invited to submit proposals were:

Applied Logic, Automated Information Systems, Bunker-Ramo, Burroughs, Call-A-Computer, Codex, Collins Radio, Computer Leasing Corp., Compunetics Inc., Computer Communications Inc.

Computer Industries Inc., Computer Sciences Corp., Control Data, Data Products Corp., Data 100 Corp., Data Processing Sciences Corp., Datel, EDP Central Inc., Futronics Corp., General Automation Inc., General Dynamics Corp.

General Electric, Honeywell, Hughes Aircraft Co., Informatics, Information Technology Inc., Infotran Inc., Intercontinental Systems Inc., IBM, ITT Data Services, NCR, North American Rockwell Information Systems Co., Potter Instrument Co., PRC Computer Center Inc.

RCA, Rixon Electronics Inc., Sperry Rand, Standard Computer, Stromberg Datagraphix Inc., Systems Consultants Inc., Systems Development Corp., Texas Instruments Inc., URS Data Sciences Co., Vitro Corp. of America, and Xerox Data Systems.

## Venture Capital Proves Important

(Continued from Page 87)

money that is raised, the nature and purpose of the business, marketing plans, operating history, products that have been developed, products that are planned, pricing policy, expansion plans, forecasts, competition, managements background, and financial projections.

### Too Quick, Too Soon

Good financial planning dictates that a new company not go to the money market too quick, too often, and for too little. A public offering through regulation A for \$300,000 sounds like a lot of money, but if the objective is to build a national time-sharing network, it will never be enough.

One way to handle such a situation is to initially seek \$300,000, but from one of the new venture capital groups. It will be less expensive than going to the public, the financing vehicle will be more flexible, and will also provide a very strong ally in a company's climb to success.

Once the company has made

some real progress toward its objective, it can then go to the public, but for \$2 million at \$20 a share, rather than \$300,000 at \$3 a share.

It is always better to have something to offer the money managers. A prototype has more impact than a blueprint, a contract is better than expertise, etc.

Once a company has made a public offering, it is almost impossible to go back to the public in the near future unless substantial success and earnings are available.

### Investment Banker Helps

There are two basic reasons a company should seek the assistance of a qualified investment banker. One, the business plan which will be presented to the institutional investor must be factual, but it also must sell.

A second, but subtle reason, is that the last thing any firm wants to do is to have the company "shopped" among investors. Every investor wants the first chance to invest in the best deal.

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### Data Processing

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- Real Property/Land Use
- Social Services
- Administrative Services
- Library Systems

Our installation provides all data processing services for the County and includes duplexed IBM 360's (models 40 and 50) under DOS, an operational CRT terminal environment, optical reader, digitizer and X-Y plotter.

Opportunities currently exist at the following levels:

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11.7 K start

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Attending the Fall Joint Computer Conference? Call Mr. Vandermate at (702) 736-2933 November 16th through 20th, for an interview, or send resumes and inquiries to:



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## Contracts

Tri-Comp Corp. has been selected to design and develop an advanced computer-based hospital information processing system, according to an agreement concluded between the Miami computer firm and Howard University for the university's Freedmen's Hospital in Washington, D.C. The system will be oriented toward patient care, but will incorporate major support functions and will have provisions for medical training, research, and development. Design and development costs are expected to be over \$4 million, to be provided by outside funding.

Computer Data Systems, Inc., has been awarded contracts by the Kiplinger-Washington Edi-

tors and the National Institute of Neurology and Stroke totaling \$182,000 to provide systems analysis and programming support in the conversion and updating of the Kiplinger subscription fulfillment system.

Computer Systems Technology, Inc. (Comstec), Jenkintown, Pa., has been awarded exclusive sales agreements to market a select group of third-generation application software to the banking industry by United Penn Bank, Girard Trust Co., and Western Pennsylvania National Bank.

Information Systems Corp., Washington, D.C., has been awarded a \$255,000 contract to provide time-sharing services to

the U.S. Naval Academy. Under the terms of the contract, 30 terminals will be installed at the academy to train instructors in their use.

Nars Computer Systems, Inc., Orlando, Fla., has signed a contract with Clark and Lewis Co., wholesale food distributors, to implement an order-entry billing system on a computer time-sharing basis. The program will provide for a variety of on-line business functions.

Beta Instrument Corp. has announced receipt of sale and lease awards totaling \$505,000 for the company's newly developed Beta Com 600, a computer output microfilmer capable of printing high-resolution alphanumeric and graphics.

Princeton Time Sharing Services, Inc., signed a contract with TCR Service Inc., an Englewood Cliffs, N.J., firm that specializes in information systems, to provide a means for retrieving information about more than 500,000 trademarks.

Franklin Regional Hospital has recently gone on-line with Medinet, a computer service of GE to automate its payroll and personnel accounting functions.

Under an order valued at over \$400,000, Bryant Computer Products will supply 25 CPHDs 50 CLC-1s and two 10512 magnetic storage drums to Scientific Control Corp. The Bryant Storage drums will be interfaced and sold as part of SCC's SCC4700 system.

National Data Processing Corp. has been awarded a contract to implement its life and health insurance data processing system for Workmen's Benefit Fund. The contract provides Workmen's Benefit with a license to utilize National Data's Lila and Hila Mark II insurance package, a consolidated functions system that will run at Workmen's Benefit Fund on a 32K five-tape Honeywell 125 computer.

An incentive time-and-materials contract that provides a bonus in the event of early delivery has been awarded to General Computer Services from the Barnett First National Bank of Jacksonville, Fla., and the National City Bank of Cleveland to develop an automated personal trust accounting system.

Ampex Corp. has begun delivery of core memory systems under a \$400,000 contract from On-Line Systems, Inc. for use in time-sharing applications.

A one-year contract with a value of around \$600,000 has been awarded to Information and Communication Applications Inc. by the U.S. Department of Agriculture to convert data from over 17-million financial records.

A \$1 million order for computerized patient-monitoring equipment was announced by Automated Medical Systems, Inc. and Honeywell Inc. The order includes eight Model 316 mini-computers and 15 Model 516 small-scale systems. The system will be used to monitor patients' bodily functions such as heart, lungs, and kidneys.

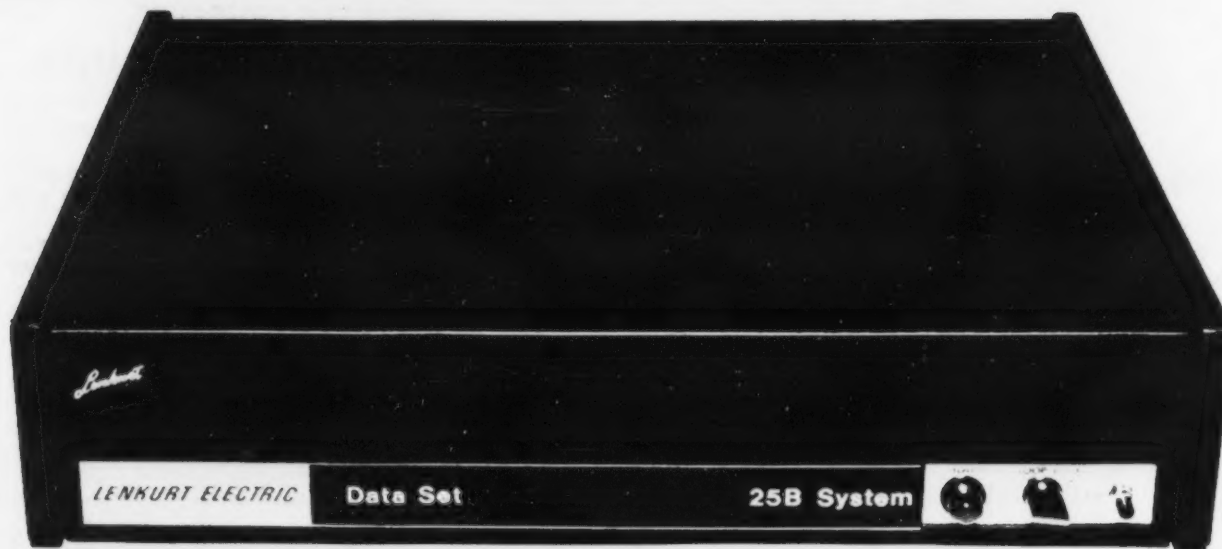
Bonner & Moore Associates, Inc., Houston, management consultant subsidiary of Fluor Corp., has been awarded a contract for the design, development, and installation of a computer-based data acquisition system for use by Venezuelan Sun Oil Co., operator for a five-member group engaged in the off-shore production of gas from Maracaibo fields in Venezuela. The system consists of on-shore and off-shore components.

Lockheed-California Co. has awarded EMR-Telemetry, Sarasota, Fla., a contract for a processing system to handle flight test telemetry data from Lockheed's new L-1011 commercial jet airliner.

Time-Sharing Terminals Inc., Washington, D.C., has awarded an exclusive contract to Westinghouse Electric Co. to provide teletypewriter terminals and telephone couplers for Westinghouse's new commercial national time-sharing network. The contract provides a three-year exclusive agreement for equipment and service to be supplied to the Westinghouse manufacturing information services department.

Data Products Corp., Los Angeles, has been awarded an order in excess of \$1 million from the computer division of Electro-Mechanical Research, Inc. The order calls for Line/Printers to be used by Electro-Mechanical Research in its standard line of computers.

# Announcing the little black box to end all little black boxes.



The Lenkurt 25B may be the only data modem that really deserves to be called a little black box. For a modest-sized piece of equipment, it does an amazing job.

It handles computer, telegraph, and telemeter data... individually or in combination.

You can transmit up to 25 channels over a single voice circuit. Plug-in filters give you a choice of five data speeds from 75 b/s to 600 b/s.

And you get 20% more speed for a given channel spacing than you've ever had before.

You can use it for single-channel or multi-channel operation. Or as terminal equipment to work into other modems.

People who know our other video, voice, and data equipment won't be surprised to learn that the 25B is fully compatible with Western Electric's 43A/43B. (We've always been very easy to get along with.)

The 25B is a great little black box, designed by a company that really knows data transmission. (And microwave, multiplex, cable carrier, and coaxial cable systems, too.)

Even though to us, it will always be a computer-telegraph-telemeter data modem to end all computer-telegraph-telemeter data modems. Lenkurt Electric Co., Inc., San Carlos, California.

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COMPUTERWORLD

## emerging enterprises

### General Purpose Digital Computer Developed by Computer Development

DALLAS — Computer Development Corp. is a new firm developing a general purpose digital computer in the \$1,000 price range aimed primarily at the original equipment market.

President William A. Roessl, who was a cofounder and first president of International Computer Products of Dallas, emphasizes that the new generation design of Computer Development equipment may require lengthy production and testing time.

"Our quality control will not permit premature marketing," he replied when asked why he had turned down unsolicited advance orders from OEM corporations.

The proposed thousand word capacity computer has a cycle time of 200 nsec. With a built-in direct memory access and allowance for real-time interrupts, among other features, the unit is said to be extremely adaptable to specific situations.

#### Omega Opens With Spectra

LOS ANGELES — Omega Computer Corporation, operating as a "computer utility service" will concentrate in specific areas of business and industry.

Complete back offices systems procedures will be available through Omega Computer for mutual funds, stock brokers, insurance companies, banks, and other financial institutions and certain franchise operations.

Omega Computer has set up shop in 10,400 sq ft at 2140 West Olympic Boulevard in Los Angeles.

About 2,600 sq ft of that space now houses an RCA Spectra 70 computer.

#### Other New Companies

★ Ross Telecommunications Engineering Corp. will work in telecommunications and computer systems by contracting with commercial and government clients to provide system architect services.

The main business purpose of RossTec is to design systems for clients by selecting from components, software and media offered by the computer and telecommunications industries.

Dan C. Ross is president of the new firm located at 1750 Pennsylvania Ave., N.W., Washington, D.C.

★ Software & Systems Design Corp. of Calif., a new firm offering data processing services to computer users, has been established.

Services will include systems analysis, design and implementation, development of procedures, documentation standards, software packages, programming, and information services.

★ The organization of Pan-sophic Systems Inc., data pro-

cessing consultants to management, was announced by Joseph A. Piscopo, president.

The Chicago firm, based at 230 E. Roosevelt Road, Lombard, Ill., provides information processing services in the areas of systems analysis and design, programming, training of EDP personnel, consulting on EDP problems, and assistance in selection of computer hardware and software.

## Alloys Unlimited Adds Management Group

SANTA MONICA, Calif. — Alloys Unlimited's subsidiary Bissett-Berman Corp. has formed the management data systems (MDS) division under Marshall Williams, general manager.

The division will combine high-technology data collection hardware with computer control techniques to create new operations and maintenance management tools.

MDS says it will also be capable of assuming full systems management responsibility for dataflow systems, from source data acquisition to operations reports, statistical analyses, and management information displays.

MDS will develop conceptually new kinds of microcomputers to collect, process, and display real-time use data from auto-

mobiles, trucks, heavy off-road vehicles for construction and mining, railroad rolling stock, marine engines, and stationary equipment.

Where appropriate, the microcomputers will utilize the company's patented E-Cell coulometer, a tiny unit about the size of a Navy bean that can add, subtract, and remember information over time periods from seconds to months.

#### CIG Subsidiary Will Design Metal Oxide Semiconductors

LARCHMONT, N.Y. — Computer Investors Group, Inc. has formed Molecular Sciences, Inc. as a subsidiary of CIG to design and manufacture metal oxide semiconductor circuits and circuit systems.

Computer Investors Group estimates that it will be at least one year before Molecular Sciences starts manufacturing of circuits and circuit systems.

The formation of Molecular Sciences marks a planned diversification by Computer Investors Group, Inc.

#### Other New Subsidiaries

★ National Computer Services Corp. has formed NCS Franchising Corp. to engage in the business of franchising certain of the services presently performed by National Computer Services Corp., which are "Comput-Estate", "Comput-A-Club", and "Computer Invoicing".

The subsidiary will be located in New York City.



### YOU BET YOUR SWEET TELEX OPERATOR IT IS!

Beneath that Telex keyboard is a full-fledged 16-bit word-length digital computer with the most powerful I/O structure available today. It's the DATACOMP 404.

Hardware decimal arithmetic, including multiply and divide with automatic scaling, eliminates binary/decimal conversion. On I/O, automatic formatting eliminates expensive editing software.

Word-length operating modes that are built into the 404's hardware can be programmed for 16, 32, 48, or 64 bits, doing away with multi-precision routines.

Sixteen addressing modes, including double-index and relative, hardware-streamline the most complicated routines and permit you to relocate object programs.



The 404 executive hardware time shares its own terminals while acting as THE INTELLIGENT TERMINAL in a time-shared network.

If you're an OEM and you're thinking of force-feeding a binary bit-switcher to solve decimal problems, Telex us before you make a sad mistake. The 404 starts at \$6800.

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## Earnings Reports

SCANTLIN ELECTRONICS			DATA PRODUCT CORP.			DIEBOLD COMPUTER LEASING			BUNKER-RAMO CORP.			CONTROL DATA CORP.		
Nine Months Ended Sept. 30			Six Months Ended Sept. 27			Nine Months Ended Sept. 30			Three Months Ended Sept. 30			Three Months Ended Sept. 30		
1969	1968		1969	a1968		1969	1968		1969	1968		1969	a1968	
Shr Ernd	\$1.11	\$1.19	bShr Ernd	\$1.11	\$1.15	aShr Ernd	\$2.29	\$1.17	aShr Ernd	\$1.14	\$0.09	gShr Ernd	\$1.83	\$1.71
Revenue	7,069,895	6,546,686	Revenue	18,449,731	16,998,080	Revenue	22,894,000	7,447,000	Revenue	62,283,867	64,024,929	Revenue	137,149,000	107,068,000
Earnings	234,570	382,000	Spec Items	c49,000	d121,022	Earnings	1,225,000	624,000	bEarnings	4,498,925	3,430,559	bEarnings	12,247,000	10,595,000
<b>GREYHOUND COMPUTER</b>			eEarnings			a-The report states that the per-share earnings are based on average shares outstanding after giving effect to the redemption of 750,000 shares of class B-1 common shares as of March 31, 1969.			a9 Mo Shr			g9 Mo Shr		
Three Months Ended Sept. 30			a-Restated by company to reflect the acquisition of Stelma Inc., in May, 1969, on a pooling-of-interests basis; b-Based on income before special items; c-Credit represents federal income tax carry-forward; d-Debit represents markdown of securities to market value, less a tax-loss carry-forward; e-Equal to 12 cents a share in 1969 and 13 cents in 1968.			a-Shares based on income before tax credits; b-Equal to 19 cents a share in the quarter and 56 cents a share in the nine months, compared with 15 cents and 38 cents, respectively, in the like periods of 1968.			Revenue			Revenue		
1969	1968		b-Based on income before special items; c-Credit represents federal income tax carry-forward; d-Debit represents markdown of securities to market value, less a tax-loss carry-forward; e-Equal to 12 cents a share in 1969 and 13 cents in 1968.			Revenue			191,547,512			410,454,000		
Shr Ernd	\$2.25	\$3.33	<b>WESTERN UNION TELEGRAPH</b>			Nine Months Ended Sept. 30			bEarnings			e3,499,000		
Revenue	12,785,000	10,590,000	Shr Ernd			1969	1968		13,109,344			f42,731,000		
Earnings	1,066,000	1,414,000	Revenue			\$1.83	\$1.21		8,696,829			a-Restated to reflect acquisitions on a pooling-of-interests basis; b-Includes net income of Commercial Credit Corp. amounting to \$7,628,000 in the quarter and \$23,209,000 in the nine months, compared with \$6,765,000 and \$18,749,000, respectively, in like 1968 periods; c-Based on income before special credit; e-Gain from sale of certain manufacturing subsidiaries of commercial credit; f-Equal to \$2.90 a share; g-Based on common stock and common stock equivalents.		
9 Mo Shr	.85	.97	Earnings			288,766,390	267,929,006		a-Based on income before tax credits; b-Equal to 19 cents a share in the quarter and 56 cents a share in the nine months, compared with 15 cents and 38 cents, respectively, in the like periods of 1968.			<b>AMERICAN COMPUTER LEASING</b>		
Revenue	37,136,000	27,352,000	Per-share earnings, as reported by company, assuming the exercise of employee stock options and conversion of convertible preferred stock would have been \$1.84 in the 1969 period.			19,695,969	13,794,456		Nine Months Ended Sept. 30			1969		
Earnings	3,665,000	4,049,000	<b>DATARAM CORP.</b>			Three Months Ended April 30			Shr Ernd			1969		
<b>HONEYWELL INC.</b>			1969			1969	1968		\$0.67			1968		
Three Months Ended Sept. 30	1969	1968	Shr Ernd			\$0.04	(\$1.13)		Revenue			5,226,654		
Shr Ernd	\$0.90	\$0.74	Revenue			433,162	63,405		Earnings			1,316,315		
Rev	338,400,000	318,600,000	Earnings			3,141	(68,470)		Pro forma share earnings, assuming full dilution, as reported by company were 58 cents in 1969 and 29 cents in 1968.			1,644,910		
Earnings	13,700,000	11,000,000	(Loss)			<b>WABASH MAGNETICS, INC.</b>			Three Months Ended Sept. 30			1969		
9 Mo Shr	2.65	2.06	Revenue			Three Months Ended Sept. 30			1969			1968		
Rev	1,009,800,000	913,100,000	Earnings			Shr Ernd			\$0.99			\$0.90		
Earnings	39,800,000	30,600,000	(Loss)			Revenue			2,245,139,000			1,986,155,000		



### A quiet I/O for only \$835. And, it's available NOW!

The Telewriter from Electronic Information Systems (EIS) gives you a small price, small size and solid-state reliability.

It's completely compatible with existing computer interfaces... remote or direct. In fact you can use it anywhere you want I/O or printed data communications.

The extensive use of solid-state circuits to replace most mechanical operations does more than just make the Telewriter highly reliable. You also get the added benefit of quiet operation.

You can talk to your computer with the quiet Telewriter in an office, a lab, a computer room... or

anyplace else... without the work-disturbing racket of the big mechanical machines.

This is truly portable I/O. The Telewriter goes where you need it... when you need it. It weighs only 25 lbs, and is so small that it will fit under an airline seat.

And, looks are more than just a secondary consideration with the Telewriter. It's available in decorator colors to match your or your client's decor requirements. (Not everything that's small has to be ugly.)

Want to know more? Just drop us a line. We will send you a brochure with all the technical information you need.

Prove to yourself that the ET39 Telewriter is the first significant advance in low-cost I/O devices in 20 years. Contact Electronic Information Systems, Inc., 2400 Industrial Lane, Broomfield, Colorado 80020. Phone (303) 466-1985.

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E159/1

GENERAL ELECTRIC		
Three Months Ended Sept. 30		
1969	1968	
Shr Ernd	\$1.17	b\$1.10
Revenue	6,207,499	4,126,831
Earnings	289,121	165,281
a9 Mo Shr	.47	b.32
Revenue	18,686,264	12,143,970
Earnings	819,276	551,668
a-Assumes conversion of preferred stock-series A; b-Restated to reflect potential dilution if and when conversion privileges for preferred stock-series A are exercised.		

COMPUTEST CORP.		
Three Months Ended August 31		
1969	a1968	
Shr Ernd	\$1.12	\$0.05
Revenue	1,868,072	1,071,261
Earnings	112,270	46,294
a-Restated by company to reflect the results of Microdyne Instruments Inc., acquired Nov. 1, 1968, on a pooling-of-interests basis.		

RAYTHEON CO.		
Three Months Ended Sept. 28		
1969	a1968	
Shr Ernd	\$0.65	\$0.61
Revenue	306,700,000	276,824,000
Earnings	9,566,000	8,858,000
Avg Shrs	14,384,930	14,275,471
b9 Mo Shr	1.80	1.60
Revenue	919,854,000	856,937,000
Earnings	26,537,000	c22,126,000
Spec Chg	...	d1,276,000
Avg Shrs	14,373,224	14,244,417
a-Restated to reflect acquisitions. b-Based on income before special charges. c-Equal to \$1.51 a share. d-From discontinuance of operations of an Italian subsidiary.		

TRW INC.		
Three Months Ended Sept. 30		
1969	a1968	
Shr Ernd	b\$.57	\$.50
Rev	381,369,000	359,083,000
Earnings	19,033,000	17,311,000
9 Mo Shr	b1.74	1.53
Rev	1,161,793,000	1,108,768,000
Earnings	57,977,000	52,627,000
a-Restated to reflect acquisitions. b-Results for the quarter include a gain of two cents a share and results for the nine months include a gain of seven cents a share, reflecting a change from accelerated to straight-line computation of depreciation on some assets. Per share earnings on a fully diluted basis, as reported by company, were 56 cents in the quarter and \$1.71 in the nine months, compared with 50 cents and \$1.52, respectively, in the like 1968 periods.		

## CD Ltd. to Open European Support Center

LONDON — Control Data Ltd., the British company of Control Data Corp., has announced plans to establish in London a European support center using a CDC 7600 in 1971.

The center will include a Control Data Institute and will serve the needs of Control Data and its customers in gaining education and experience in the operation of this computer.

The London location reflects Control Data's recognition of the importance of the U.K. market to its worldwide operations.

When operational, the London support center will provide computing support services via terminal hookups to other Control Data European locations such as Frankfurt, Stockholm, and Rome. It can also provide similar services for Control Data's installations in the U.K.

The London institute will be opened to the public in early fall, 1970, with its standard courses for computer programmers and computer technicians, using a medium-scale CDC computer system for its students.

### Computer Property Corp. Opens New Data Center

NEW YORK — Computer Property Corp. has opened a new data center in New York's financial district to provide specially developed computerized services to brokerage firms.

The company's automated brokerage operations systems, called CPC "Security I," has been in operation for nearly two years by a member firm of the New York Stock Exchange and is currently being implemented by several other firms.

The data center has been set up solely for the benefit of brokerage firms seeking a system that will handle billing, bookkeeping, and other operations on an economical, efficient basis, according to a company spokesman.

Brokerage clients who use the new facility will receive documents ready for use at the start of every business day. These include inventory costing, full margin reports, daily blotters, balanced stock record, and fail lists.

Computer Property Corp. said it expects to establish similar data centers in other major cities throughout the country during 1970.

### Ge to Offer Time-Sharing Service in Puerto Rico

Plans for the introduction of GE computer time-sharing service in Puerto Rico have been announced. The new service is scheduled to start in early November and will be operated by International General Electric Puerto Rico, Inc.

Service to Puerto Rico will mark the first on-line computer service available in the Caribbean area. In addition to the U.S., G.E. now offers time-sharing in Canada, United Kingdom, France, Germany, Italy, Belgium, Switzerland, Netherlands, Denmark, Sweden, Norway, Austria, Luxemburg, and Australia.

One unique feature of GE time-sharing, according to a company spokesman, is that more than 300 computer programs in GE's library are usable

anywhere in the world. Programs of multinational users can be used on any GE system, no matter where the users may be located.

### Other Expansions

Computer Equities, Inc. has opened new headquarters offices in Houston at 4120-B Directors Row in the Brookhollow Business Park. The company is engaged in the lease and sale of computer communications equipment, primarily data communications terminals, and acoustical couplers.

General Automation, Inc., Orange Calif., has opened a technical application center in the Chicago area. Services will be available through General Automation's sales and service office

at 2590 E. Devon Ave., Des Plaines, Ill.

Cambridge Computer Associates, a firm of consultants providing systems analysis, programming, and documentation services in all areas of computer usage, has moved to 220 Alewife Brook Parkway in Cambridge, Mass.

International Communications Corp., Miami-based subsidiary of Milgo Electronic Corp., has opened a western operations office in Los Angeles. The new office, located in Suite 114, Airport Arcade, 8820 Sepulveda Blvd., will serve as the headquarters for sales and customer service of the data communications products manufactured by ICC.



COMPUTERWORLD

## expansions

### Time-Sharing Network Serving Eight Major Cities Completed

WASHINGTON, D.C. — A nation-wide computer time-sharing network that includes eight major cities has been completed, said Miss Van Horn, president of VIP Systems.

VIP Systems provides a wide range of government and industry clients with an on-line information processing service that includes centralized data banks with up-to-the-minute prices, specifications and other information for clients' branches, field

forces and support personnel who have immediate access from anywhere in the country; on-line typewriter-compatible photo-composition services; and facilities for standard data processing functions such as accounting and billing from remote typewriter terminals in the clients' offices.

Offices have been opened in New York, Boston, Los Angeles, San Francisco, Chicago, Cleveland, and Philadelphia, she said.



**at 27 lbs.,  
the Execuport 300  
is the lightweight portable  
data transceiver that  
does a heavyweight job.**

Meet the champion. Lightning fast. Quietly professional. Truly versatile. Solidly reliable. Always ready to go to work . . . anywhere. That's Execuport 300, our thermal page-printing data transceiver.

**How fast?** A switch lets you choose among three speeds: 10, 15 or 30 characters per second.

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**How reliable?** As dependable as today's solid-state technology can be.

And, best of all, Execuport 300 is ready to go to work . . . anywhere. Keyboard, thermal page printer, solid-state control logic, telephone coupler, data access jack and interface, plus a universal interface for peripheral accessories—all components are enclosed in an attractive, integral carrying case.

Weighing in at 27 pounds, the Execuport 300 is a lightweight doing a heavyweight job. Is it any wonder we're claiming the title this early in the game?



**COMPUTER TRANSCIVER SYSTEMS INC.**

123 Pleasant Avenue, Upper Saddle River, New Jersey 07458

To see and hear for yourself, visit Booths 3861 to 3864 at the 1969 Fall Joint Computer Conference in Las Vegas, November 18-19-20.

## Acquisitions

Transamerica Computer Co., Inc. of San Francisco, a wholly owned subsidiary of Transamerica Corp., has agreed in principle to acquire **Reproduction Systems, Inc.** of Salt Lake City, Utah, subject to the approval of Reproduction Systems shareholders. Transamerica Computer is engaged in computer and peripheral equipment leasing and in consulting and system design activities. Reproduction Systems provides worldwide commercial microfilm services.

**Computer Image Corp.**, Denver Colo., computer animation firm, has entered into preliminary acquisition negotiations with **Les Weisbrich & Associates, Inc.**, having headquarters in Beverly Hills, Calif.

**Diversified Technologies, Inc.**, New York, a subsidiary of The Singer Co., and **Brogan Associates, Inc.** have jointly announced that they have reached an agreement in principle whereby DTI will provide capital in exchange for partial ownership in four Brogan Associates' manufacturing subsidiaries—**Magnetic Recording Systems, Inc.**, **Peripheral Data Machines, Inc.**, **Miteq, Inc.**, and **Computer Management Corp.** Diversified Technologies deals in available scientific and engineering expertise, management counsel, and advice to selected companies. Brogan Associates is a technical marketing organization in the data systems field with main offices in Westbury, Long Island.

**Bergan Brunswick Corp.** (American), Saddle Brook, N.J., a national drug wholesale computer and medical services company, has announced a definitive agreement to acquire **Mediservice, Inc.** Mediservice and its two subsidiaries, **San Joaquin Surgical Supply Co.** of Stockton, Calif., and **Valley Medical Supply, Inc.** of Modesto, Calif., will be acquired for stock having a maximum value of about \$3.5 million including an initial payment in **Bergan Brunswick** stock plus a future earnings stock payout formula.

**Slent Computer Corp.**, Houston, Texas, has agreed in principle to acquire **Valley Colleges, Inc.** for an undisclosed amount of Slent stock.

**Intel Corp.**, San Francisco, has reached an agreement in principle to acquire **Intercontinental Systems, Inc.**, through an exchange of common stock. Intel is a data processing company consisting of four operating subsidiaries. Intercontinental develops, manufactures, and markets a line of data handling equipment including electronic typewriters, computer terminals, and text editing devices.

**Magnetic Head Corp.**, Hauppauge, N.Y., has announced that through a wholly owned subsidiary it has reached an agreement in principle to acquire the stock of **Dentronics, Inc.**, a New Jersey corporation engaged in the manufacture and sale of cores for magnetic recording heads, strain gages, and sensor devices.

The boards of directors of **Information Systems Corp.**, Washington, D.C., and **Data Automation Design, Inc.** of Woodbridge, Va., have approved the acquisition of Data Automation by ISC. Prior to completion, the offer must be approved by the shareholders of Data Automation Design. Terms of the acquisition were not disclosed. Information Systems provides operations analysis, computer software, time-sharing, and data processing services to federal, state, and local governments as well as industry. Data Automation Design specializes in computer services, including data processing and software to industry and government.

**Maiman Associates**, headed by Dr. Theodore H. Maiman, and developer of the first laser, has acquired **Computer Security Systems, Inc.** of Beverly Hills, Calif. for an undisclosed amount of stock. CSS has developed complete systems incorporating its own modems that permit unattended, automatic operation over telephone lines between computers and terminal equipment including other computers.

**Programming Sciences Corp.**, New York, has completed negotiations to acquire **Spectrodata, Inc.**, Los Angeles, a firm that specializes in the real-time programming segment of the computer software industry. The acquisition was concluded for an undisclosed amount of PSC common stock. Programming Sciences is a software development and systems programming firm.

**Horizons Research, Inc.**, Cleveland, and **Metaphoto Corp.**, Warrensville Heights, Ohio, have approved a proposed agreement under which Horizons Research and Metaphoto would merge. Metaphoto would operate as a wholly owned subsidiary of Horizons Research. Horizons Research is a research-oriented company serving both government and industry in the fields of chemical, physical, metallurgical, electronic, and photographic sciences. Metaphoto manufactures photosensitive anodized aluminum on which the company and its customers reproduce a wide variety of identification material such as nameplates, wiring and flow diagrams, trademarks, lubrication charts, photographs, art reproductions, and advertising specialties.

**Consolidated Analysis Centers, Inc.**, Santa Monica, Calif., has entered into an agreement with **Vendere International Marketing Corp.**, Torrance, Calif., to purchase a one-third interest in Vendere for an undisclosed amount. Consolidated Analysis Centers is engaged in the application of advanced computer analysis and software techniques for government and industry. Vendere International Marketing is a national marketing and service organization for the information sciences and computer industry.

**Computer Studies, Inc.** of New York, which operates schools and other service businesses, has acquired **Seltz Franchising Development, Inc.** of New York, for an undisclosed amount of stock.



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The unit is completely self-contained, with keyboard, CRT, electronics, and power supply. A result of advanced solid-state technology, the VST/1000 is ideal for time-sharing companies, large and small. And our nation-wide network of service centers keeps it that way.

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5. CODE Full 128 Character ASCII
6. REFRESH RATE 60Hz
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8. PARITY Even
9. CHECKING Teletype Model 33TZ, plus standard 10 key adding machine, plus ten control keys
10. CURSOR Cursor Home Control Up/Down or Left/Right  
Cursor may be moved one space at a time or slewed. Non Destructive Cursor
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13. COMMUNICATION MODE Full or Half Duplex (Switch Selectable)
14. COMMUNICATION INTERFACE RS232B, and/or TTY
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16. POWER 120 Watts
17. SIZE 18" x 18" x 18"
18. WEIGHT 55 Pounds
19. STANDARD FEATURES Totally self contained  
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1. Written on and transmitted simultaneously  
2. Written on and stored until desired  
The page in storage may be recalled for modifications  
EIA interfacing is provided including a 25 pin standard EIA connector  
The unit is directly interchangeable with a Model 33 Teletype  
Automatic Answer-back of a WRU character  
High Reliability obtained by extensive use of Complex integrated circuitry, meaning fewer parts and easier maintenance.  
Remote Monitor Capability

## Acquisitions

**Autocomp, Inc.**, Bethesda, Md., has reached an agreement in principle to acquire all outstanding stock of **Autocode, Inc.**, Washington, D.C. Autocomp is a computer software and photocomposition company. Autocode specializes in the application of computer technology to the codification of municipal, county, state, and national codes and statutes.

**Faim Information Services, Inc.**, a firm engaged in EDP consulting, executive, recruitment, and marketing services, has acquired **Executive Careers, Inc.**, a Philadelphia-based EDP recruitment firm. Faim has also reached an agreement in principle to acquire **Partners for Growth, Inc.**, a New York marketing, communications services, research strategy, and corporate counseling firm.

**Computer Corp. of the Caribbean and Brennand-Paige Industries, Inc.** has announced an agreement in principle for acquisition of all the outstanding stock of **Data Research Corp.** in exchange for common stock of Computer Corp. of the Caribbean. Brennand-Paige Industries of New York owns approximately 44% of the outstanding shares of Data Research. Data Research and Computer Corp. of the Caribbean are both located in San Juan, Puerto Rico, and are engaged in providing computer systems and program services primarily to computer users in Puerto Rico and the Virgin Islands.

**Computer Information Management Co.**, a Dallas-headquartered software company specializing in on-line information systems, management information systems, and systems design and programming, has acquired the Texas division of **CCC Computer Corp.** with rights to use a totally integrated accounting package developed by CCC. The packaged accounting system included in the transaction provides the user with computerized accounting, financial management reporting, and automatic income tax preparation. Consideration for the purchase is approximately \$800,000, consisting of a combination of cash, notes, and over-riding royalties.

**Ness Industries, Palo Alto, Calif.**, has announced the formation of **Ness Venture Management Corp.**, a wholly owned subsidiary that will augment the parent corporation's activities in the founding and management of new companies. Nevemco will establish, advise, and participate in a continuing series of limited partnerships created to invest in new high-technology business ventures. Acting as the general partner, the firm will receive compensation in the form of an interest in each investment.

**Tran State Financial, Inc.**, Woodland Hills, Calif., has announced an agreement to acquire **Information General Corp.**, a computer software company, for an undisclosed amount of TSF common stock. Tran State Financial is an acquiring company with a policy directed toward acquisitions in fields where higher-than-average growth potential can be expected.

## Orders and Installations

**Mattatuck Manufacturing Co.**, Waterbury, Conn.; **U.S. Expansion Belt Co.**, York, Pa.; and **Myrtle Desk Co.**, High Point, N.C., are installing **NCR Century 100** series computers to aid in general office procedures.

The **Defense Intelligence Agency**, Washington, D.C., will expand its capabilities with the addition of another **GE-635** information system valued at almost \$3 million. Coupled with the agency's previously acquired **GE-635**, the recently installed **GE-635** will operate with local batch processing, remote batch processing, and user-interactive time-sharing capabilities, all capable of operating concurrently and against a common data base.

**United California Bank** is installing an accounts receivable financing and factoring control that will computerize the bank's data on its clients' receivables, including aging criteria and customer credit information. The system design and programming effort is being done by **URS Research Co.**, consultants to UCB.

**Delta Air Lines** has purchased an **Electronic Retina Computing Reader from Recognition Equipment Inc.** for processing airline ticket information and ticket control. The system will read the coupon number, airline code, and form serial and check digit directly from all tickets to be processed. At the same time, the reader will perform check-digit

verification and will "select" other airline flight coupons for interline billings.

**Jackson Associates**, in cooperation with **P/E Development Co.**, has accepted a commission from **Emery Industries** to design and install the control system for a new chemical plant. In addition to performing different processes, the control will also check its own operation for errors.

**District Grocery Stores, Inc.**, in the Washington, D.C. area has ordered a **GE-115** information system that will handle accounts receivable, accounts payable, inventory, payroll, general ledger and management reports, and stock status reports.

**Toyota Motors Co.** has ordered a \$5-million **Univac 1108**. The system will be used for a variety of engineering and scientific calculations associated with auto design and manufacture. Twenty-five remote data communications terminals will be connected to the Univac 1108 and operated on a time-sharing basis.

**Docutel Corp.**, Dallas, has received orders for its docuteller currency dispenser, an automated cash-dispensing machine allowing bank customers to get cash from their accounts on an around-the-clock basis, from ten leading banks in the U.S. Total purchase value of these orders is about \$750,000.

(Continued on Page 96)

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word on computers

## Orders and Installations

(Continued from Page 95)

St. Petersburg Junior College has installed a Burroughs B2500 electronic data processing system to handle educational advancements.

Shell Oil Co. has ordered a Control Data Corp. 1700 system for monitoring, alarming, and data logging in the Shell-Pernis refinery in Rotterdam, Holland.

American Bank and Trust Co. of Mobile, Ala., has ordered a Burroughs B5500 system to facilitate demand deposit accounting, savings, installment loans, payroll, management reporting, and proof and transit operations.

The North American Air Defense Command (Norad) has purchased three specially de-

signed Control Data Corp. data entry/display units for use with computers installed at the command's combat operations center inside Cheyenne Mountain near Colorado Springs, Colo. Norad provides warning to the U.S. and Canada in case of enemy aerospace attack.

An automated data processing system using high-speed electronic displays that depict information on television-like screens, manufactured by Sanders Associates, Inc., is being used at Boston's State Street Bank to answer inquiries of mutual fund shareholders. At present, about 30 of the Sanders displays are installed at the bank, with a total of 84 scheduled for de-

livery in the near future.

Provident National Bank of Philadelphia has completed installation of CL/I, a commercial loan accounting system developed by Computer Sciences Corp., and is converting its 4,500 accounts to the system. Reports will be prepared by the system for management and loan officers to provide guidance in making intelligent credit decisions.

An SYS-2113 data acquisition and control system has been sold by SYS Associates, Inc. to Digisonics Corp. for use in a project in which TV commercials are monitored from remote stations throughout the U.S. The

SYS-2113 system converts an IBM 1130 to a real-time data acquisition, analysis, control, and time-sharing computer.

Real-Time Computing Systems has ordered two Control Data Corp. 3300 systems to centralize medical accounting for Nashville, Tenn., hospitals. The company's applications will include patient billing, inventory control, personnel records, payrolls, patient care reporting, statistical reporting, and processing of Medicare applications.

Compu-Time, Inc., Fort Lauderdale, Fla., has ordered a GE-430 time-sharing system that includes a direct access programming system (Daps) for col-

lection, accumulation, and processing of source data from distant facilities.

Industrial Computer Laboratories, Inc. has delivered a Command 690 system to the Ampex Corp., Colorado Springs, Colo., to be used in controlling production line parts requirements.

Interactive Sciences Corp. has installed a second customized PDP-10 time-sharing system at its Braintree, Mass. facility to expand services.

Frank A. Serio & Sons, Inc., a wholesale bakery in Baltimore, and Fessenden Hall Inc., a wholesale distributor of building products, have both installed Honeywell 110 systems to handle accounts receivable and payable, payroll and other general office functions. Harmony Dairy, a processor and distributor of dairy products in Pittsburgh, has ordered a Honeywell 110 system to handle the same procedures.

Process Consulting and Computing Inc., San Diego, Calif., has installed an additional Control Data Corp. 160A and another CDC 1604B. In the transaction, PCCI also received ten tape drive units, a high-speed printer, and a card reader.

Access Systems, Inc., in Paramus, N.J., has added a second Univac mass storage drum to increase service capacity.

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## General Systems Division Opened In IBM DP Group

WHITE PLAINS, N.Y. — A new division, called General Systems, has been established within the data processing group of IBM.

The new division incorporates manufacturing, development, and programming activities in the area of low-cost data processing equipment. Its principal locations will be at Boca Raton, Fla., and Rochester, Minn., where IBM has plants and laboratories.

Commenting on the announcement, G.B. Beitzel, IBM vice-president and general manager of the data processing group, said: "The company is establishing the general systems division to place a special focus on the low end of the product spectrum."

"The new division also places general management responsibility at the operating location."

"To accomplish this, the plant general manager and the laboratory director will now report to a location general manager who becomes responsible for the product from start of development through the manufacturing process to customer shipment."

### Includes System/3

The general systems division's products will include the recently-announced System/3, unit record equipment, and key entry devices other than data transmission terminals.

C.B. Rogers Jr. has been named president and general manager of the general systems division.

He was vice-president, marketing and development, in the company's data processing division. Rogers will report to Beitzel.

The Rochester manufacturing and engineering facilities will report to Donald L. Stephenson, who has been appointed location general manager.

Stephenson was systems manager, advanced unit record systems in IBM's systems development division.

The Boca Raton manufacturing and engineering facilities will report to William W. Eggleston. He was director, product line management, European laboratories.

IBM's data processing group develops, manufactures, markets, and services computers and other data processing products, and provides related support services. In addition to the new general systems division, it includes the components, data processing, field engineering, systems development, and systems manufacturing divisions.

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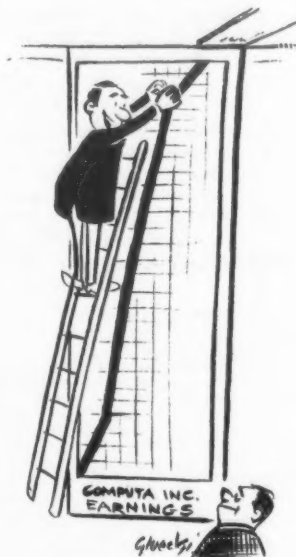


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# COMPUTER STOCKS: TRADING SUMMARY

LISTED CLOSE 11/6 OTC CLOSE 11/7

COMPUTER SYSTEMS					WEEK	
EXCH	1969 RANGE	CLOSING PRICE			NET CHANGE	% CHANGE
N	167-120	150 5/8	BURROUGHS CORP	-	1 1/2	-0.99
N	69-38	53	COLLINS RADIO	+	4	8.16
N	159-114	121 3/8	CONTROL DATA CORP	+	4 5/8	3.96
A	93-54	90 1/2	DIGITAL EQUIPMENT	+	3 3/4	4.32
N	25-13	15	ELECTRONIC ASSOC.	-	1	-5.26
N	98-81	84	GENERAL ELECTRIC	-	1/8	-0.15
N	114-75	112 3/4	HEWLETT-PACKARD CO	+	4 3/4	4.40
N	157-107	153	HONEYWELL INC	-	2	-1.29
N	365-291	360 1/2	IBM	-	---	---
N	150-100	145 1/2	NCR	+	3/8	0.26
N	48-35	40 5/8	RCA	-	3/8	-0.91
N	50-30	37 3/4	RAYTHEON CO	-	7/8	-2.27
O	43-17	20	SCI. CONTROL CORP.	+	3	-13.04
N	55-38	45 7/8	SPERRY RAND	+	1/4	0.55
A	50-24	45	SYSTEMS ENG. LABS	-	1/2	-1.10

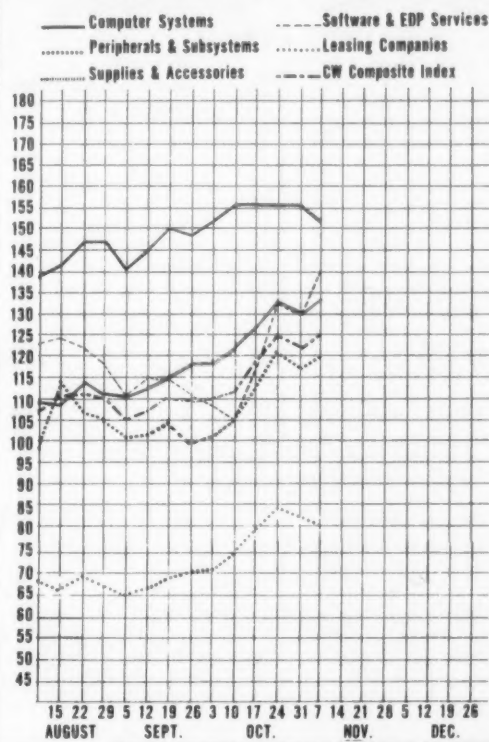
PERIPHERALS & SUBSYSTEMS					WEEK	
EXCH	1969 RANGE	CLOSING PRICE			NET CHANGE	% CHANGE
N	85-59	74 1/4	ADDRESSOGRAPH-MULT	-	1	-1.33
O	71-11	18	ALPHANUMERIC	+	1 3/4	10.77
N	49-32	48 1/8	AMPEX CORP	+	1	2.12
O	19-7	15 3/4	BOLT, BERANEK & NEW	-	1/4	-1.56
N	17-9	15 3/4	BUNKER-RAMO	+	1 1/8	7.69
A	37-18	33 5/8	CALCOMP	+	4	13.50
O	38-13	18	COGNITRONICS	+	3 1/2	24.14
A	13-7	11 1/2	COMPUTER EQUIPMENT	+	1 3/8	13.58
A	27-12	17 7/8	DATA PRODUCTS CORP	-	---	---
O	22-13	16 1/4	DIGITRONICS	-	1 3/4	-9.72
N	83-43	81 3/4	ELECTRONIC MEMORIE	+	3/4	4.93
O	12-6	8 3/8	FABRI-TEK	+	3/8	4.69
O	37-13	20 5/8	FARRINGTON MFG	+	3 3/4	22.22
O	21-10	19 1/2	INFORMATION DIS	+	1 1/4	6.85
A	61-17	55 1/8	MILGO ELECTRONICS	-	1	-1.78
A	89-59	88	MOHAWK DATA SCI.	+	3 3/4	4.92
O	118-47	59	OPTICAL SCANNING	+	3	5.36
O	29-16	23 3/4	PHOTON	-	1/4	-1.04
A	46-23	37 3/4	POTTER INSTRUMENT	-	2	-5.03
O	76-52	70 1/2	RECOGNITION EQUIP	+	1 1/2	2.17
N	61-22	30 1/4	SANDERS ASSOCIATES	+	7/8	2.98
O	85-28	33	SCAN DATA	-	---	---
O	36-15	23	TALLY CORP.	+	1	4.55
N	115-85	107 3/8	XEROX CORP	+	1 1/8	1.06

SUPPLIES & ACCESSORIES					WEEK	
EXCH	1969 RANGE	CLOSING PRICE			NET CHANGE	% CHANGE
O	47-31	36 1/2	ACME VISIBLE	+	1/2	1.39
N	22-11	16 5/8	ADAMS-MILLIS CORP	-	3/8	-2.21
O	27-23	25 1/2	BALTIMORE BUS FORM	-	1 3/4	-6.42
A	29-17	25 1/4	BARRY WRIGHT	-	3/8	-1.46
O	44-26	34 1/4	DATA DOCUMENTS	-	1/4	-0.72
N	42-28	38 7/8	ENNIS BUS. FORMS	-	1 1/8	-2.81
N	150-65	150 1/2	MEMOREX	+	19	14.45
N	115-94	115 1/2	3M COMPANY	+	1 1/2	1.32
O	37-29	35 3/4	MOORE BUS FORMS	-	---	---
N	49-36	43	NASHUA CORP.	-	1/8	-0.22
O	48-30	43	REYNOLDS & REYNOLD	-	1 1/2	-3.37
O	31-23	26 1/4	STANDARD REGISTER	+	1/4	0.96
N	36-25	34	UARC	-	1/4	-0.73
A	20-10	16 7/8	WABASH MAGNETICS	+	5/8	3.85
O	37-27	37 1/4	WALLACE BUS FORMS	+	1 3/4	4.93

SOFTWARE & EDP SERVICES					WEEK	
EXCH	1969 RANGE	CLOSING PRICE			NET CHANGE	% CHANGE
O	14-4	6 3/4	ADVANCED COMP TECH	-	1/4	-3.57
A	39-19	24	APPLIED DATA RES	+	3/8	1.59
O	19-6	9 1/2	ARIES	+	1	11.76
A	119-63	108	AUTOMATIC DATA PROC	+	1	0.93
O	15-7	13 1/4	AUTO SCIENCES	-	1 3/4	-11.67
O	17-7	7 1/4	BRANDON APPL SYS	-	1/4	-3.33
A	21-9	14 1/2	COMPUTER APPL	-	---	---
O	16-6	12 1/4	COMPUTER ENVIRON	+	3 1/2	40.00
O	47-14	19	COMPUTER NETWORK	-	1	-5.00
N	30-19	30	COMPUTER SCIENCES	+	1 3/4	6.19
O	40-7	18	COMPUTER USAGE	+	1/2	2.86
A	65-37	65 1/8	COMPUTING & SOFT	+	5	8.32
O	24-3	4 1/4	DATAMATION SERVICE	-	1/4	-5.56
O	17-6	7 1/2	DATATAB	+	1/4	3.45
O	15-4	5 3/8	DIGITEK	+	3/8	7.50
A	38-9	13 1/2	ELECT COMP PROG	+	3/8	2.86
O	30-11	18	INFORMATICS	+	2 1/4	14.29
O	19-1	2 1/4	MATRIX CORP.	-	---	---
O	22-4	8	NAT COMP ANALYSTS	+	1/2	6.67
A	45-23	42 1/2	PLANNING RESEARCH	-	3/8	-0.87
O	11-4	5 1/2	PROGRAMMING & SYS	-	1/2	-8.33
O	10-3	4 1/4	SOFTWARE SYSTEMS	+	1/4	6.25
O	37-3	4	STRATEGIC SYS	-	1/4	-5.88
O	36-11	18 3/4	TBS COMP CENT INC.	-	1/4	-1.32
O	12-3	4 3/8	UNITED DATA CENTER	-	1/8	-2.78
N	105-64	104 7/8	UNIVERSITY COMP	+	10 3/8	10.98
O	31-17	27 1/2	URS SYSTEMS	+	2 1/2	10.00
O	16-7	8 3/4	U.S. TIME-SHARING	-	---	---

LEASING COMPANIES					WEEK	
EXCH	1969 RANGE	CLOSING PRICE			NET CHANGE	% CHANGE
O	14-8	10	BANISTER CONTIN	+	1/8	1.27
O	45-23	25 1/2	BOOTHIE COMPUTER	-	3 1/4	-11.30
O	18-4	10 1/4	COMPUTER EXCHANGE	+	1 1/4	13.89
A	34-10	17 1/8	COMPUTER LEASING	-	1/8	-0.72
O	13-7	13	CYBER-TRONICS	-	1/4	-1.89
A	60-23	37 1/8	DATA PROC. F & G	+	1 3/8	3.85
O	16-5	8 1/2	DATRONIC RENTAL	-	---	---
A	52-24	28 7/8	DEARBORN COMPUTER	-	2 1/4	-7.23
A	13-8	11 7/8	DPA, INC.	+	3/8	3.26
A	45-16	26 1/8	GRANITE MGT	+	1/8	0.48
A	28-12	15 1/2	GREYHOUND COMPUTER	-	1	-6.06
N	54-22	28 1/2	LEASCO DATA PROC.	-	3 1/8	-9.88
O	9-4	5 3/4	LECTRO COMP LEAS	-	5/8	-9.60
A	57-23	32	LEVIN-TOWNSEND CMP	+	1/4	0.79
O	8-3	3 1/4	LHC DATA, INC.	-	---	---
O	14-2	3 1/2	MANAGEMENT ASSIST	-	1/2	-12.50
O	12-5	7	NCC LEASING	-	---	---
A	44-18	44 1/4	RANDOLPH COMPUTER	+	1/4	0.57
O	34-5	6 1/4	SYSTEM CAPITAL	-	1/4	-3.85
A	28-13	19 1/8	U.S. LEASING	-	2 5/8	-12.07

## Computer Stocks Trading Index



## N. White Resigns From Farrington, McCloskey Reigns

NEW YORK — The board of directors of Farrington Manufacturing Co. announced the resignation of Norville E. White as chairman of the board and as a director.

White, who has been with Farrington since 1961, said he was leaving Farrington after having achieved his goals for the company in the past eight years.

"When I joined Farrington it was with the understanding that I would assist in making Farrington competitive in its chosen fields, would create a sound financial and operational base for the company, and would create a new management team. These goals have been accomplished," he said.

The board of directors further announced that Peter F. McCloskey, president and chief executive officer, has been elected to the additional post of chairman of the board.

## BELL & HOWELL FJCC BOOTHS 1502-1502A

THERE'S A BRAND NEW NUMBERS GAME IN TOWN.

Bell & Howell's FJCC booth 1502-1502A. Bell & Howell is now firmly in the digital-data business; we expect soon to be as well known there as we are in analog data.

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3. The Bell & Howell Data Master that permits data storage on convenient magnetic cards. Potential applications include data-collection stations, information retrieval, computer I/O and mass storage.

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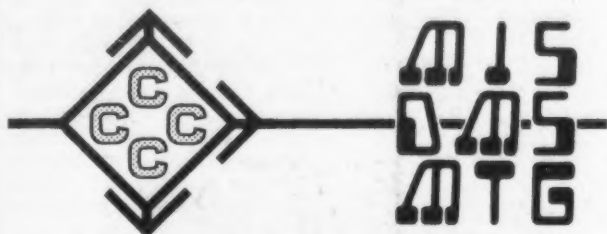
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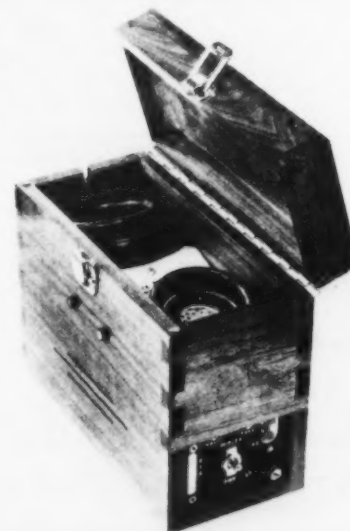
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## R.F. Penne Heads Southern Cal. Lab, Plans Expansions

LOS ANGELES, Calif. — Appointment of Ross F. Penne to head the computer sciences laboratory at the University of Southern California was announced today.

Penne succeeds Dr. Glenn E. Lewis, who resigned.

Penne's appointment coincides with a major expansion program of the USC computer sciences

### EDPeople

laboratory's services and facilities. A new IBM 360/65, valued at more than \$2 million, was installed recently.

"We are now planning for future installation of remote terminals at many locations on the campus, enabling students and researchers to consult the central computer from their own laboratories or offices," Penne said.

In 1957 he joined the electrodata division of Burroughs Corp., where he developed application approaches, produced computer programs, and conducted market research for product planning.

From 1958 to 1962, he was with TRW, Inc. There he participated in the design and development of computer graphics display consoles, and later was responsible for planning and implementing tests and demonstrations of the equipment.

In 1962, Penne joined IBM, where he served in the advanced development, engineering, and sales divisions. He participated in the installation and implementation of computer systems at several major universities, including UCLA, Caltech, and USC. For three years he was at the IBM San Jose, Calif., laboratory, where he assisted in planning for direct-access storage devices, designed business application programs featuring terminal usage, and served as a computer consultant to a large commercial bank.

## President Elected, Former Duties Go To 3 Executives

DAYTON, Ohio — Advanced Computer Systems, Inc. appointed Peter D. Senkiw as president.

Senkiw was formerly executive vice-president of the Kettering based computer systems counseling firm.

Senkiw said his former duties as executive vice-president would be distributed among three of the firm's executives. They are George Pierce, vice-president and treasurer; Todd Rapp, vice-president of technical development; and Irvin M. Kuhn, director of business and contract administration.

Senkiw joined ACS in August, 1968, as vice-president of administration and marketing, prior to becoming executive vice-president in May, 1969.

ACS was founded in January, 1968. Sales projections for 1970 are set at \$450,000 Senkiw added.



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**NCR Appoints 2  
Assistant VPs to  
Software Group**

DAYTON, Ohio - Appointment of two assistant vice-presidents of the National Cash Register Co. to new major responsibilities in the development and marketing of computer software has been announced.

The appointments stem from the recently announced NCR pricing structure in which the company will supply certain essential and pre-determined systems support, educational assistance and software without charge, but will price separately additional services required above that basic level.

Effective immediately, Hugh J. Lynch will become assistant vice-president, software marketing; and William P. Keating will become assistant vice-president, software development.

Lynch will be responsible for the development of marketing policies and strategies in the area of software, including support services, educational assistance, and both applied programs and basic software. He will also be charged with the development of outside software resources and the administration of contract placements.

Keating will have responsibility for the development of all software, both basic and applied programs. He will also be responsible for the development of application programs which are being generated in specific industry areas, such as for banks, retailing, manufacturing, and education.

**Executive Corner**

□ Computer Control Corp., Buffalo, N.Y., has named Robert C. Baker as district manager for the company's district office for western New York.

□ Data Management Services, Inc., New York, has appointed Robert J. MacBain to the new post of manager, research and planning, for the firm's implementation division. In his new position, MacBain's primary responsibility will be the study of present and potential business opportunities for the implementation division. This includes research in unfulfilled software needs of industry, additional division services, and required new capabilities.

□ Ronald G. Donoghue has been appointed manager, management information systems, of National-Standard Co., Niles, Mich. In this newly created position, Donoghue will supervise the overall activities of a computer being acquired by the company. He will work with all operating departments and divisions of the company in utilizing computer services.

□ Fabri-Tek Co. has named Orval D. Larson to head its new Chicago area sales office. The Chicago office will handle all products of the memory products division.

□ Digital Information Devices, Inc., Lionville, Pa., has appointed John D. Bauman to the new post of manager of engineering.

**D.P.  
PLANNING**

Our organization is seeking three individuals to complete a D.P. Planning team responsible for the development and implementation of a large-scale data processing research and development program. Individuals selected for these positions will research, develop, and implement Advanced Banking Applications, Management Information Systems, and Central Information Files for a four billion dollar banking organization.

All of these positions require a bachelors degree; however, preference will be given to individuals holding advanced degrees in mathematics, finance, banking, management, or related fields.

**QUALIFICATIONS - MANAGEMENT INFORMATION SYSTEMS**

A minimum of 5 years experience in banking or data processing is required. In addition, you should be experienced in the use of Operations Research Techniques, Mathematical Models, and similar techniques. Current or previous experience in the development and implementation of Management Information Systems is preferable.

**QUALIFICATIONS - CENTRAL INFORMATION FILES**

The individual chosen must have a minimum of 5 years experience in banking or data processing, preferably both. Demonstrable performance in large-scale system design and a working knowledge of Operating Systems, High-Level Languages, Compilers, and Random Access Storage Techniques is required. An understanding of the On-Line Environment and Data Base Management Techniques will be required.

**QUALIFICATIONS - ADVANCED BANKING SYSTEMS**

A minimum of 5 years experience in banking and data processing is required. Knowledge of large-scale system design, commercial and trust applications is essential; as is an awareness of today's bank processing environment, banking structure and practice.

Since these are senior level positions, the individuals selected must be capable of presenting themselves, and their ideas, to executive management. Communications skills as well as in-depth knowledge and expertise are required. Each position will incorporate continuing research and development and responsibility for implementation coordination. Please call 385-2122, Las Vegas, Nevada.

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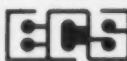
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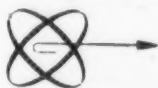
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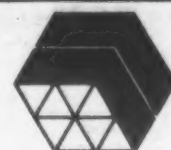
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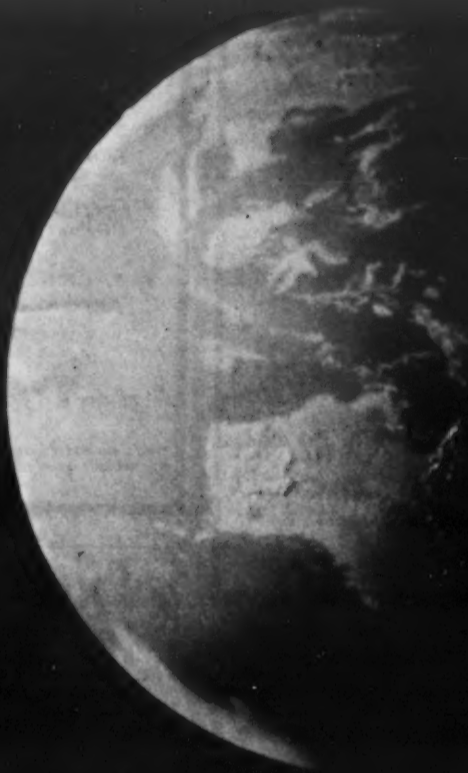
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